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News

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Beginners

Pete Bibby's gentle introduction to basic Basic programming.10

Coffee

A challenging word game that comes from Down Under.

Casting Agency

Not just shapes - but also how to make your characters move! 14

Showtime

Come and meet us at the Electron and BBC Micro User Show. 16

Competition

18

49

Win yourself a complete set of software games for the Electron. Paper, Scissors, Stone

Outguess the Electron if you can in our version of the old game.

Notebook

Draw multi-coloured lines - and see 20 how it's done.

Software Surgery

All you want to know about the latest in software from our frank reviewers.

Bookshelf

A book review with a puzzling game for you to sample.

Graphics

Coloured text made easy in the latest of our series on 26 graphics.

Funny Polygons

Colour and cunning go together to produce high speed circles. 31

Sounds **Exciting**

We give you programs to produce sounds for your programns,

Counter

Test out your powers of mental arithmetic against the Electron. 35

Chicken

Keep death off the roads with this actionpacked game.

Mean

Calculate averages with your Electron the program explained. 39

Maths Workout

Explore your Electron's limits with real and integer variables. 40

What's That?

The first of a regular series on the mysteries of the micro. 43

Character Generator

An invaluable utility to help you create your casting characters. 44

Tape Offer

Want our programs but too tired to type them in? Here's how to get them all on cassette.

Bright Eyes

Easter bunnies fill the screen with our fast breeder program. 47

Parky's Peril

Help Parky escape from the invisible maze.

Decider

Can't make up your mind? Let the Electron help do it for you. 50

Reaction Timer

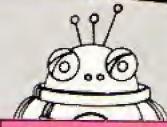
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Micro Messages

The page you write yourself. A selection from our mailbag. 62



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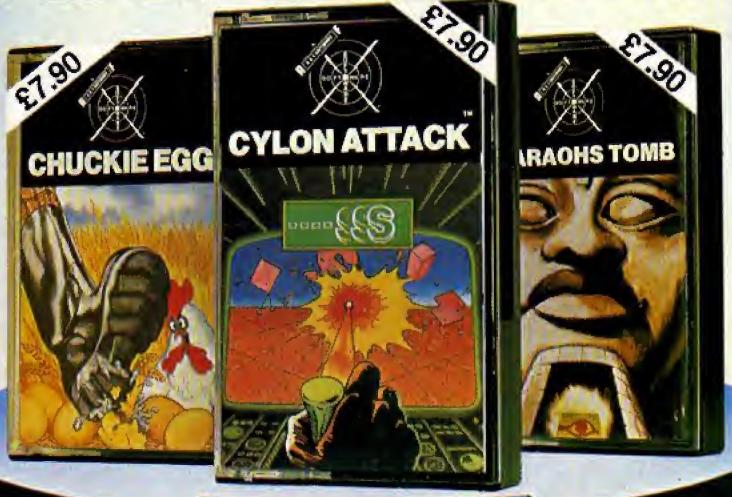
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Electron Eddie-torial

RIGHT from when Electron User was launched six months ago we have described it as a magazine written for and by Electron users.

That last bit, the "by Electron users", is what I want to talk about this month.

I want to stress that Electron User is written entirely by Electron users – which means you and people like you.

As it is, we've already received a lot of material. We've had a tremendous response to our requests for Casting Agency characters and noises for Sounds Exciting.

Now we'd like you to send us YOUR programs. We're never satisfied!

And don't think that you can't do it, that you couldn't write something that will appear in print,

because I know that you can.

Someone once said that everyone has one novel inside them and I strongly believe that everyone has at least one original program inside them.

I'd like to see it in the pages of Electron Userl

You'd be amazed at the number of times someone shows us a program that we'd love to use and says: "But you won't be interested in that..."

And don't make the mistake of thinking that for something to appear in Electron User it has to be written by someone with twenty degrees in computer science or one of these computer whizz kids you keep reading about. It's YOUR programs we want.

If you go to the time and trouble of writing a pro-

gram it must be because it's of some use or interest to you!

And if it's of interest to you then it'll probably be of interest to another Electron user, won't it?

So let's have your programs and articles. Short ones, long ones, serious ones, joke ones, simple ones, complicated ones they're all welcome.

Take a look at the magazine and see all the different types of listings we carry.

You might not be able to write an arcade style game but what about something for our Notebook, which this month is on Page 20.

Could you write a simple program for that? Or perhaps you could turn out a graphics program for us.

Each month Nigel Peters will be examining the working of a short program. Why not send him yours? We've already got some excellent writers but we

So, if you're a Yosser, if you look at the magazine and say "I can do that" -

Let's have your cassettes with your programs on them to:

here's your chance.

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Remember, if you're an Electron user, then *Elec*tron User is your magazine.

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Pete Bibby

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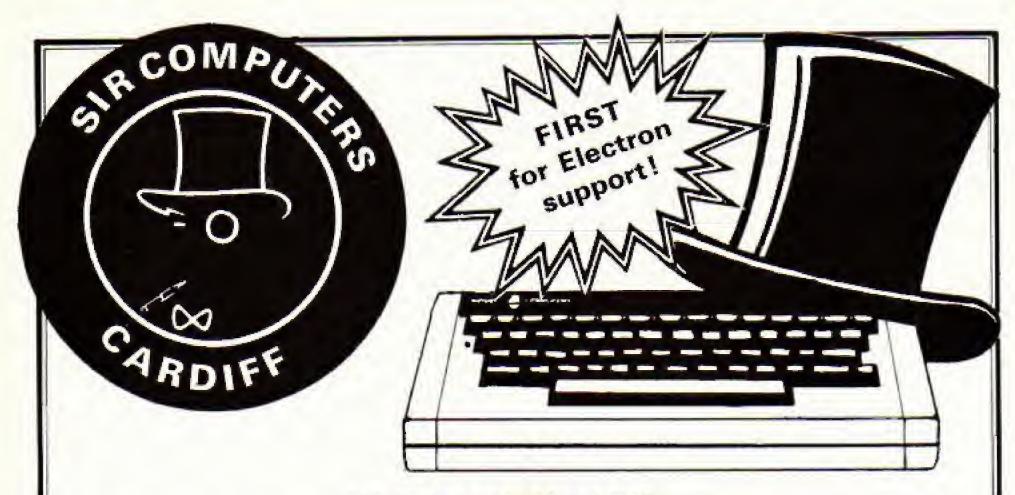
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electron WEWS



Pamela Hauser receiving the award on behalf of her husband from Ian McNaught Davis, presenter of the BBC TV series.

SMITHS EXPECT BUMPER SALES

THE Electron is all set to come second only to the Spectrum in sales through the W.H. Smith computer shop outlets during 1984.

"It's going like a train", John Rowland, the group's marketing manager, told Electron User.

"We could certainly sell far more than we can get hold of at the moment as there is still a problem in getting sufficient supplies".

No actual sales figures are available at the present as the company has changed its financial year end from January 31 to May 31.

"Because of this we are in what is described as a 'mute period' and I am not allowed to reveal the actual figures", said Mr Rowland.

But he did admit that there are already clear indications that the Electron is going to be a very successful machine this year.

Nor does he base this prediction entirely on the number of machines W.H. Smith hope to sell through their micro shops.

"Naturally we take

New course

FIRST on the scene with a correspondence course for the Electron is Walrus Computer Education.

Their 10 lesson teaching pack on Structured Basic sells for £24, including software cassettes. this into account", said the marketing manager, "but what is of equal importance is the level of interest being shown in the Electron from peripheral manufacturers and software houses — and that is tremendous".

Electron chief wins 'Oscar'

HERMANN Hauser, the Acorn executive with overall responsibility for the research and development of the Electron, has been awarded the computer industry's equivalent of an Oscar.

The joint managing director of Acorn was recently named as winner of this year's RITA (Recognition of Information Technology Achievements) award as personality of the year.

However, just like so many of the Hollywood Oscar winners in recent years, he was unable to



Hermann Hauser

attend the presentation core mony in Birmingham as he is currently in Japan on company business.

So his wife Pamela ascended the rostrum to receive the trophy on his behalf from lan McNaught Davis, the television personality who fronts the "Making the Most of Your Micro" TV series.

Hermann Hauser holds a doctorate in physics from Cambridge where he attended the prestigious Cavendish Physics Laboratory.

It was while he was involved in post doctorate studies that he met Chris Curry, his fellow joint managing director.

As a result they eventually formed Acorn in December, 1978.

Five super shows

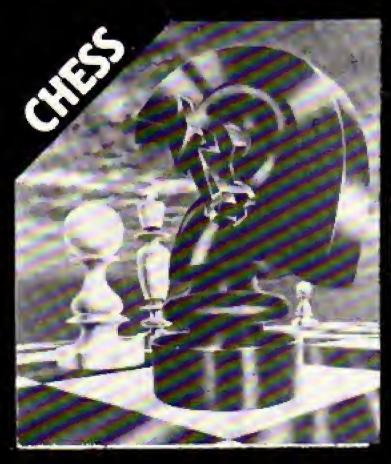
MORE than a quarter of a million people are expected to attend a series of shows devoted to the Electron and BBC Micro this year.

Four of them are being held in London and one in Manchester.

The Electron and BBC Micro User Shows are jointly sponsored by Electron User and our sister publication, The Micro User.

The London shows are to take place from March 29 to April 1 at

SOFTWARE FOR THE ELECTRON



LOGO2

One of our most popular programs to date. This is not a game, but an introduction to the LOGO graphics language that has become so popular in schools. It incorporates the 'turtle' graphics and many other leatures common to all LOGOS. Fascinating patterns or other graphics work can be built up very easily using the set of inbuilt commands. The command set can be extended by adding new 'words' to its vocabulary based on the existing set. Logo 2 can be used as a very simple graphics aid for young children, but it can incorporate more advanced ideas — defined procedures, sub-routines, loops and even recursive programming. Supplied with full documentation.

£11-50 incl.

CHESS

Excellent use of the high-res graphics help to make this the most flexible chess game available. A choice of hundreds of different skill levels control the playing strength. This game has been continually updated over the past few years and this later version incorporates a host of new facilities, including the ability to: change the board and piece colours; replay a game, move by move; change levels whilst playing; ask the computer to suggest a move; force the computer to make a move at any time; save a game on tape or disc; blitz play within a time limit; mate in 2, 3 or 4 moves; castle and en passant.

£8.95 incl.

DRAUGHTS

From the same author as our best selling Chess program, this game incorporates many of the features of that program — various skill levels, save a game to tape, replay a stored game, etc. etc. A high resolution colour display (the user may change the colours) and an option to choose the rules of play make this game extremely flexible.

Works with all Operating Systems.

£8-95 incl.





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VISA

Software's flooding in

ELECTRON software is coming in thick and fast. All over the country software firms are taking the opportunity to enter the new market that has been opened up. by the new machine.

The leaders at present appear to be Micro Power of Leeds, now busily converting BBC Micro programs to run on the Electron.

The firm has 13 Electron titles in the shops and more are on their way.

"It's not just rehashing an old product", said a Micro Power spokesman. "We've taken the chance to improve the games where ever possible".

Meanwhile across the Pennines in Rochdale A&F software is bringing out more Electron titles to join the acclaimed Cylon Attack and Pharoahs Tomb.

Kamakazi, Horror Castle and Chuckie Egg.

are being added to its growing range of Electron products.

At present two major high street retail chains are negotiating with A&F to distribute their products.

"The demand is phenomenal", said a spokesman, "especially when you realise that there still aren't all that many Electrons about".

Still in the North, the Blackpool firm IJK has just launched three games for the Electron while Leeds-based Dynabyte has brought out two games and a utilities package.

Moving South, Dimax of Northampton has produced a tape containing 10 educational games, and Salamander of Brighton has released a graphics system for the Electron.

"It's amazing", said a leading dealer, "A couple of months ago we were scraping round

for Electron software and now there's so much we can't keep track".

Meanwhile Acornsoft is translating the best of its BBC Micro arcade games to the Electron.

"We hope to convert as many BBC titles as possible", said a spokesman,

"Also future releases of software will be in both BBC and Electron forms as far as this is possible".

US release next year?

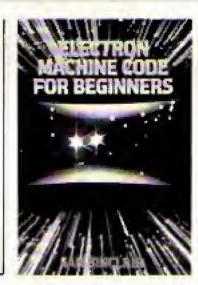
PLANS are under way to release the Electron in the USA within the next 12 months.

Following the initial success of the BBC Micro in the US educational markets, Acorn intends to send its "little brother" to join it.

There will be differences in the US version of the Electron, mostly because the Americans use a television system which has a different way of handling colour.

Also there are fewer lines on the screen, which means that the US Electron will have slightly altered modes. This will give fewer lines on the screen in any mode.

The gain is that each mode uses less memory, leaving more for the programs.



Machine code manuals

TWO books that aim to help readers make the most of the Electron's built-in assembler are being released this spring.

comes Ian Sinclair's "Electron Machine Code for Beginners".

Aimed at the complete beginner, it assumes nothing more than a reasonable knowledge of Basic. The second is "Electron Assembly Language" by Bruce Smith from Shiva.

This also is aimed at the beginner and covers the Electron's registers, absolute and indirect addressing, the stack and how to use the operating system routines.

From Granada

'The London shows are to be held at intervals of around three month - and three months is a long time in the computer marketplace".

MR win Electron add-ons race

THE race to produce the first hardware add-ons for the Electron has been won by a firm from north of the border.

Micro Research of West Lothian started selling their Cloud "black box" in early January, pipping their rivals at the post.

As reported in last month's Electron User the Cloud contains a Centronics printer interface, an A/D converter and joystick ports.

At first the sales are by mail order only but MRL hopes to start selling through selected retail outlets in the near future.

Meanwhile late January saw the arrival of the long-awaited Sir Computers range of Electron peripherals.

As expected, the first two products are the 12 ROM board and the printer and joysticks interface.

The arrival of the ROM board is particularly exciting, hugely increasing the scope of the Electron.

present these are being kept under wraps.

Not to be outdone by the Scots and the Welsh, an English firm has brought out its own Electron add-ons.

Signpoint of London has a joystick interface for the rear expansion connector.

It has also produced the Myriad, an Electron interface adaptor which gives four copies of the rear connector, allowing more peripherals to be added.

In addition the Myriad has its own external power supply connector, useful when hanging a lot of add-ons to the Electron.

Back at Acorn, the news is that the first official expansion module for the Electron will be available shortly after Easter.

The module comprises an A/D input (suitable for joysticks), a Centronics printer interface and two sideways ROMs.

The unit, seen as the first of a series of expansion modules, is expected to retail at around £70.

Top shows planned

From Page 7

the Westminster Exhibition Centre; July 19 to 22 at Alexandra Palace; October 25 to 28, also at Alexandra Palace; and from December 6 to again at the Westminster Exhibition

UMIST in Manchester is to host the single show outside the capital from August 31 to September 2.

"We are well aware of the fact that this is the most ambitious project ever to be undertaken by the organisers of computer shows", says Derek Meakin, Joint Managing Director of Database Publications.

"But let us not forget

that we exist in a rapidly changing market. As a result, we will be able to unveil a batch of new and exciting products at each of the shows.

> The Cardiff firm has other plans for expanding the Electron, but at

HELLO, and welcome to the second of this series of beginners articles. It's nice to have you with me again.

If you read last month's article you may remember that I promised we would start writing programs this month.

Simple programs, even stupid programs, but computer programs nevertheless.

First, though, let's just go through what we did last month as we'll be using the concepts we covered then in the programs we're going to write.

We learned that to "talk" to the Electron we had to speak to it in a language it understood – Basic.

We learnt one Basic word of power, PRINT, and saw how to use it to put messages on the TV screen and to give the answers to simple sums.

For example, we could use: PRINT 2+2

to give us the answer to the sum. (Not forgetting to press the Return key to tell the

And now for the next step

Electron to act on what we've typed in.)

We're not just limited to sums, either. We can do subtractions, multiplications and divisions using PRINT—as typing in the following will show:

> PRINT 50-25 PRINT 50+25 PRINT 50/25

Notice that special symbols are used for multiplication and division.

PRINT can also be used to print out strings (collections of letters and symbols, treated as one job lot). Type in:

PRINT "This is a string"

Press the Return key and the message will appear on the TV screen.

At this point I would like to announce that I'm going to stop telling you to press the Return key every time it's needed. Sometimes I'll leave it up to you to remember.

So if you've typed something into your Electron and nothing appears to be happening, try pressing the Return key.

This tells the micro that you've typed in all you want to type in and that it is to obey these instructions.

You'll see from the message we put on the screen that the Electron can tell the difference between capital (or upper case) letters, and small (or lower case) letters. We can have:

PRINT 'HELLO"

Ō٢

PRINT "Hello"

Q1

PRINT "hello"

as we choose.

We can't, however, have PRINT in anything but capitals. It's a Basic keyword and for the Electron to recognise it and obey it, it has to be in upper case letters. Try:

Print "Hello"

Q1

print "Hello"

and see what you get.

My advice is, for the time being, keep the Caps Lock on. The yellow light to the left of the keyboard will be shining when this is the case. This way you'll avoid the errors shown above.

Now let's get on with writing programs. You'll have noticed so far that we have been giving the Electron one instruction at a time. We then pressed Return to get it to obey that instruction.

Sometimes, however, we want to give the Electron a series of instructions and then have it carry them out.

Suppose we wanted to have the micro display a message such as:

> ELECTRON USERS ARE BRILLIANT

on the TV screen.

Using the step-by-step method we've employed so far we would type in:

PRINT "ELECTRON" PRINT "USERS"

PRINT "ARE"

PRINT "BRILLIANT"

pressing the inevitable Return key after every instruction.

Try it out for yourself and you'll see that you don't get the required message.

The problem is that the instructions we've typed in appear on the screen between the messages the micro prints out. This spoils the display,

What we need is a method of getting the micro to print out the messages one after another without stopping for the next instruction. It would:

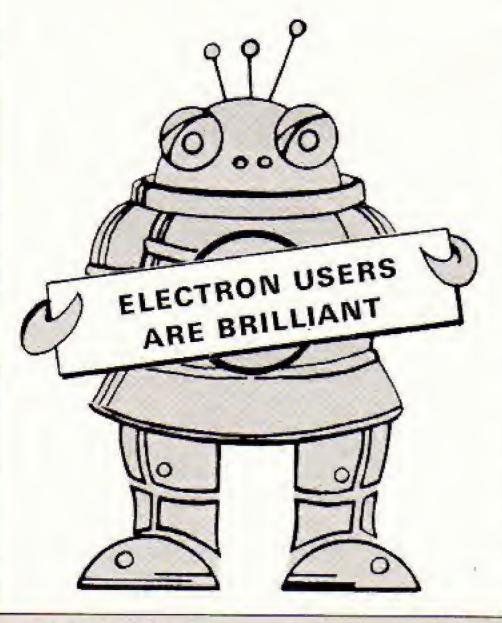
- 1. Print out ELECTRON
- 2. Print out USERS
- 3. Print out ARE
- Print out BRILLIANT in sequence without the instructions showing on the TV screen.

This sequence of instructions, obeyed in order, one after another, is called a computer program. Let's write a program to print out

> ELECTRON USERS ARE BRILLIANT

The step by step method wasn't all that wrong as we'll need to use the PRINT command to get the message on the screen.

However, let's try numbering the instructions as we type them in. After all, the micro has to know what order to obey the PRINT commands.



otherwise the message will be jumbled.

First of all though, let's learn about another Basic keyword, NEW.

When you type in NEW and press Return you clear out whatever is in the Electron's memory. If you don't do this before you start typing in a program, it might get jumbled up with any previous programs that you've typed in.

This will become more obvious as you type in more programs. If you like, entering NEW is like wiping a blackboard clean so you can start afresh.

Right, so you've cleared the micro's memory with NEW. Now type in:

10 PRINT "ELECTRON" and press Return.

There are two things to notice. First of all the instruction appears to have had no effect on the Electron.

It didn't display ELECTRON on the screen as we might have expected after pressing Return.

This is because we put a number before it. This number is the "line number" of that instruction.

When the Electron comes across a number at the beginning of an instruction it doesn't obey it immediately but stores it away in its memory.

You need another Basic keyword to get the micro to obey the instruction behind the line number.

Until you give it that Basic keyword the line will just stay in memory.

The second thing to notice is that, although the instruction is the first one we want obeyed, we gave it the line number 10 and not 1 as might be expected.

In computing we tend to number our program lines in steps of 10 for reasons that will become clear as you progress.

So far we've got one line of our program in the Electron's memory. Now let's give it the rest of the instructions.

Type in:

20 PRINT "USERS"

30 PRINT "ARE"

40 PRINT "BRILLIANT"

Don't forget to press the Return key after every line so as to enter it into the micro's

memory.

By now the screen should be looking a little untidy so let's clear it by pressing the L key and the CTRL key (you'll find it on the left of the keyboard) at the same time.

Hey Presto! the screen is cleared! But what's happened to the program we typed in? Has that gone as well?

The answer is that the program is still in the micro, hidden in its memory.

All we've done is to clear the screen. The Electron has all the instructions safely stored away, one after another in the order of their line numbers.

To see them we'll use a new Basic keyword, LIST. Type in:

LIST

and press Return. Your program should appear on the screen. Let's call it, logically, Program I:

10 PRINT "ELECTRON"

20 PRINT "USERS"

30 PRINT "ARE"

40 PRINT "BRILLIANT"

So, there's your first program. The trouble is that it hasn't done anything yet! It's just sitting there in memory.

Using LIST only shows us what's there. It doesn't get the program to actually do what we want it to.

To get the program going we have to use another Basic keyword, RUN.

This is your big moment. Your're about to run your first program. Type in:

RUN

and press the Return key to enter it into the micro.

Because there's no line number in front of AUN, the Electron obeys the instruction immediately.

It searches in its memory for the first line number (in this case 10) and obeys the instructions it finds in that line.

It then goes on to the next line number (in this case 20) and goes on to obey the instructions found in that.

It carries on like this until it runs out of lines to obey.

In other words, RUN makes the micro obey an ordered sequence of instructions.

You don't see all this, however. It all goes on inside the Electron. What you see is:

ELECTRON USERS ARE BRILLIANT



on the TV screen.

If you've managed it, congratulations on running your first program! If you haven't don't worry, just LIST the program again (it's still there, lurking in memory) and see if you've typed in each line correctly.

If one of them is wrong, suppose it's line 30, then just type in the line again as it should be.

The micro will accept this as the new line 30. If you've got it right this time, the program will work when you enter RUN.

Incidentally, if you did make a mistake, you'll probably get an error message that will give you a clue as to what's wrong and which line it's in.

You'll get a lot of these in your computing career. Don't let them worry you, they're there to help you even if they can seem anything but helpful at times!

While we're on the subject of making mistakes, what happens if you're typing a line and you make a mistake half way through? For example:

10 PRINT "ELd

isn't right. You've typed in a "d" instead of an "E".

Don't worry, if you haven't pressed Return, the line hasn't been entered into the

Electron's memory. You can just erase the "d" and put in the right letter.

To do this press the Delete key on the bottom right of the keyboard and the last letter you typed in - in this case the mistaken "d" - will disappear. Then just carry on typing as normal.

If you type in a line and realise halfway through that it's complete gibberish you can get rid of it in two ways.

You can either hold down the Delete key until all the line is erased or, more easily, press the U key and the CTRL key at the same time. Either way gets rid of the line.

Now let's after our program so that it prints out:

ELECTRON USERS ARE CLEVER

instead of what we had before. It's not difficult at all.

If you think about it all we have to do is to change line 40 to one that prints out CLEVER instead of BRILLIANT.

Type in a new line 40 and the Electron will automatically update the program. Try it now, type in:

40 PRINT "CLEVER" and LIST the program which



From Page 11

we'll call Program II.

10 PRINT "ELECTRON"

20 PRINT "USERS"

30 PRINT "ARE"

40 PRINT "CLEVER"

As you can see line 40 has been changed, the rest of the program remaining the same as before.

Now type in RUN, press the Return key and the message will appear on the screen.

So to recap, we have learnt that we can put line numbers in front of our instructions and the Electron will obey them in order when we enter RUN.

This sequence of instructions is called a computer program and if we want to see a listing of a program in memory we type in LIST and press Return.

Also we can correct or alter a line by typing in that line

There are other ways of altering program lines without having to go to the trouble of typing the whole line again, but we'll come to these later.

incidentally, if you want to get rid of a particular line altogether, just type in that line number and press Return. The Electron will delete the whole line.

Suppose we want to get rid of line 40 in Program II. All you have to do is type in:

40

and press Return. Do it and then LIST the program. You should end up with:

10 PRINT "ELECTRON"

20 PRINT "USERS"

30 PRINT "ARE"

Enter line 40 again to restore Program II.

Can you think of how we could alter Program II to give the message

ELECTRON USERS ARE VERY CLEVER

What we need to do is to have a line in between lines 30 and 40 that adds VERY to the messäge.

Logically the line number of that instruction will have to be between line 31 and 39.

This means that the Electron will obey the instruction in line 30 to print ARE, then obey line numbers usually go up in

Enter line 35, press Return and then use LIST to see the listing of the program that's now sitting in the Electron's memory.

It should look like:

10 PRINT "ELECTRON"

20 PRINT "USERS"

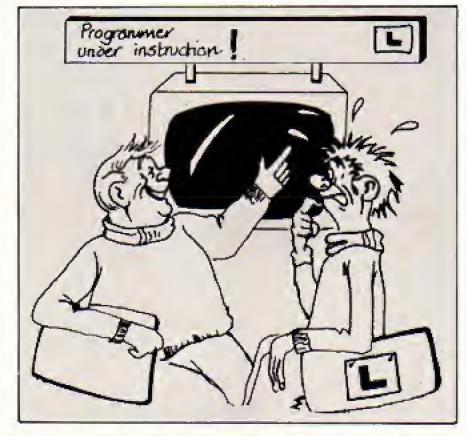
30 PRINT "ARE"

35 PRINT "VERY"

40 PRINT "CLEVER"

We'll call this Program III.

You'll see that the Electron



the new instruction to print VERY and then obey line 40. printing CLEVER.

Since you're an Electron user and so are very clever, you'll see that what we need is a line such as:

35 PRINT "YERY"

Of course it could be line number 31, or 39 or any other number that comes between 30 and 40 but 35 is in the middle and leaves us lots of room to add new lines on either side of it.

Now you can see why the

has automatically inserted line number 35 into the right place even though we entered it out of order.

Run the program to prove to yourself that it works. Don't just take my word for it, try it all out for yourself.

Right, let's try a different program. Try typing in Program IV:

10 CLS

20 PRINT "HELLO"

30 PRINT "GUT"

40 PRINT "THERE"

Once you've typed it all in use LIST to get a listing of the program in memory. Is line 35 still there? It shouldn't be, should it?

What's happened is that you didn't use NEW to clear the old Program III out of memory.

Typing in lines 10, 20, 30 and 40 of Program IV overwrote lines 10, 20, 30, and 40 of the old Program III that was still in memory but line 35 stayed put.

If you run the program with line 35 still in place you get an even sillier message than

So the rule is that you should use NEW to clear old programs out of memory before you start typing in new programs. As it is, typing in 35 and pressing Return will get rid of the gatecrashing line.

You may be wondering how line 10 works. What does CLS do? If you run program IV again, you'll see that it clears the screen, then displays the message.

In effect CLS is a Basic command that clears the screen in the same way as pressing the CTRL and L keys at the same time.

Put at the beginning of the program it produces a nice clear screen to display the message on.

And that's it for the time being. We've learnt four new Basic keywords, NEW, CLS, RUN and LIST and made use of the one we knew before, PRINT.

We've also learnt how to type in, modify and amend simple programs. That's quite a lot in one session.

Now I'll leave it up to you to play with your Electron and get some practice in running simple programs putting your own messages on the TV screen.

Remember, even though the programs are simple they illustrate the use of Basic keywords that you will be using all the time in your computing career.

The output may be fairly trivial and, as you'll find out in later articles, there may be easier ways of doing the same things.

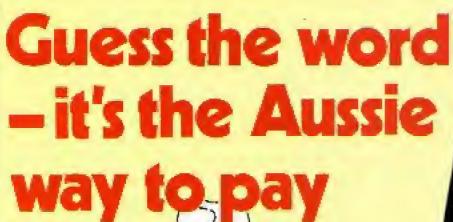
But it's the principles that are important.

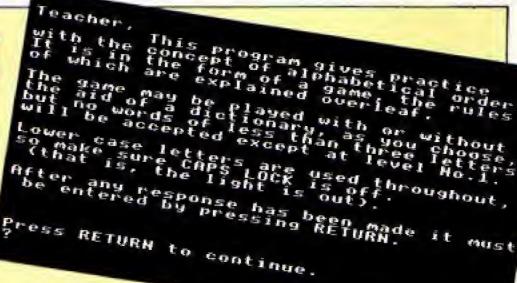
Programming is a skill and, like any skill, it needs practice to make it perfect.

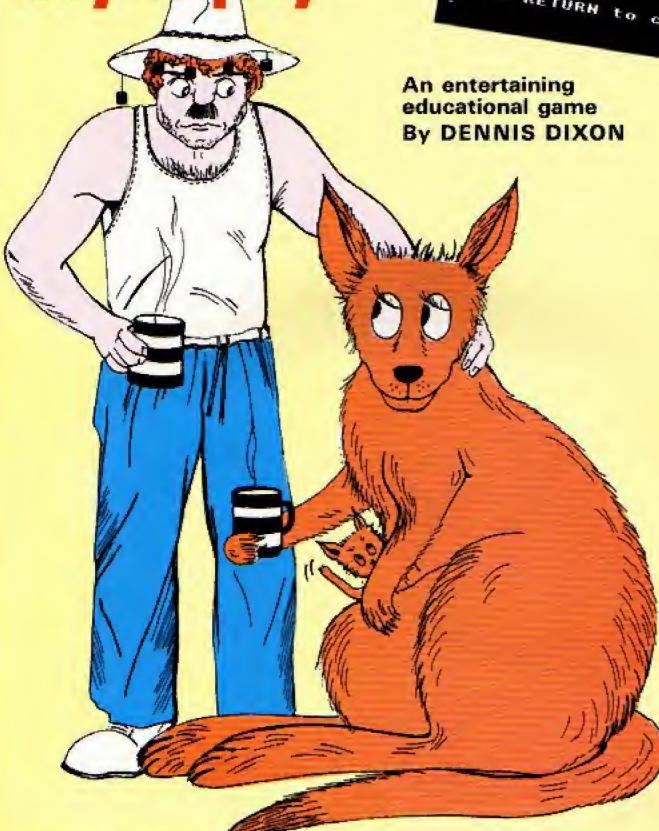
Play around with programs on your micro. You can't hurt it from the keyboard.

You'll soon pick up and master the skills that will make you a minor expert on the Electron in no time at all. Have

'Programming is a skill, it needs practice to make it perfect'







THIS month Electron User brings to you the Australian Coffee game, an easy to learn, fun to play word game for your micro that will give you hours of fun.

Apparently our friends from Down Under play this game between themselves in cafes to decide who's going to pay for the coffee (or is it how they choose their cricket teams?)

Whatever they use it for, it's certainly compulsive. The Electron "thinks" of a word and you have to guess what the hidden word is.

Not only that, but you have to tell it how many guesses you think that it's going to take you to get the right answer.

After each incorrect guess the micro will tell you whether you are getting any nearer by showing you the two guesses that were closest.

You use your knowledge of the alphabet to home in on the target word.

It's quite educational, as the notes to the teacher that you'll find in the program indicate.

But that doesn't mean it's not enjoyable. In fact it's addictive. Your coffee is likely to go cold while you're playing.

There are three levels of play and you can easily add your own words if the ones in the program don't satisfy you.

All the instructions are contained in the program, though it doesn't take long to learn the rules of the game.

So type it in and run it. The rest is up to you.

Coffee, anyone?

10 MODE 6 20 REM ** Australian Coffee Game ## 30 REM ## Dennis Dixon , Bingham, Notts, ++ 40 *FX 11,0 50 *FX202.48 60 CLS :DIM A\$ (881) 70 PROCintro 80 IF KK=4 THEN 190 90 PROCdeal 100 IF KK=1 THEN A=RMD(135) 110 IF KK=2 THEN A=RND(370) 120 IF KK=3 THEN A=RND(880) 130 IF KK=2AND A(136 **THEN 110** 140 IF KK=3AND AC371 THEN 120 150 FOR Z=1TO A 160 READ AS(A) 170 NEXT Z 180 RESTORE 190 B\$= " : D\$="a" :E\$="2222222" :8=0 : D=0 16=0 200 CLS : 75=" 210 PRINT TAB(0,4)STRING\$(40 ,CHR\$ (32)) 220 PRINT TAB (0, 6) STRING\$ (40 ,CHR\$ (32)) 230 PRINT TAB(10,16)CHR\$ (151 $Y_{i}^{*}HIIIHHIIHHIIHHI^{*}$ 240 PRINT TAB(0,4)*Type in your guess and RETURN...

Turn to Page 56

Casting Agency

THIS month Casting Agency goes live with three short programs that bring your screen brilliantly to life.

As usual we give you the VDU23 statements so that you can use the characters in your own programs.

In addition to this we're also including the programs as examples of how to make the shapes move.

Watch the helicopter fly across the screen. Can you make it fly backwards or hover? What about the vampire bat, flitting all over the screen?

Could you use the same program for the flying saucer? In fact, can you get the racing car moving round the screen?

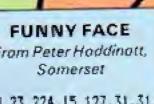
Let's see what you can do. And why not send us your own shapes and programs and see yourself in Casting Agency?

Please remember to put your names on your shapes. This month we've got two anonymous contributors. Come on, surely you're not all that shy!

From Peter Haddinatt,

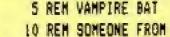
VDU 23,224,15,127,31,31, 113,85,81,95

VDU 23,226,127,28,29,28, 31,31,7,7



VDU 23,225,240,254,248, 248,142,170,138,250

VDU 23,227,254,56,184,56, 248,248,224,224



DARLINGTON

20 REM WHO DIDN'T GIVE A

NAME

30 MODE 4

40 VDU23,1,0;0;0;0;

50 VDU 23,224,0,0,20,42,

65,65,0,0

60 VDU23,225,0,0,198,68,

40,16,0,0

70 REPEAT

80 LET xpos=RND(40)-1

90 LET ypos=RND(23)-1

100 FOR Y=1 TO 10

110 PRINT TAB(xpos, ypos); CHR\$ (224)

120 SOUND &11,-15, 255-(10*ypos),1

130 FOR X=1 TO 200: NEXT X

140 PRINT TAB(xpos, ypos); EHR\$ (225)

150 FOR X=1 TO 200: NEXT X

160 NEXT Y

170 PRINT TAB(xpos, ypos)" "

180 UNTIL FALSE

10 REM FUNNY FACE

20 REM FROM PETER HODDINOTT

30 REM SOMERSET

40 MODE 4

50 VDU 23,224,15,127,31

,31,113,85,81,95 60 VDU 23,225,240,254, 248,248,142,170,

138,250

70 VDU 23,226,127,28,29.

28, 31, 31, 7, 7

80 VDU 23,227,254,56,184, 56,248,248,224,224

90 PRINT TAB(10,14) CHR\$ (224);

CHR\$ (225)

100 PRINT TAB(10.15) CHR\$ (226); CHR\$ (227)

10 REM COPTER SHAPE

20 REN FROM JOHN SPENCE

30 REM DUNSTABLE

40 MODE4

50 PROCcopter

40 PROCOOVE

70 DEFPROCcopter

80 VDU23,1,0;0;0;0;0;

90 VDU 23,240,7,96, 96,255,63,0,0,1

100 VDU23,241,255,56, 100,226,254,252,

57,254

110 VDU 23,242,192.0,

0,0,0,0,0,0

120 copter\$ = CHR\$(240)

+CHR\$ (241)

+CHR\$ (242)

130 ENDPROC

140 DEFPROCaove

150 FOR line=2 TO 30

160 FOR row=0 TO 36

170 PRINT TAB(row,line) copter#

180 SOUND&10,-15,5,2

190 FOR delay=1 TO 100 :NEXT delay

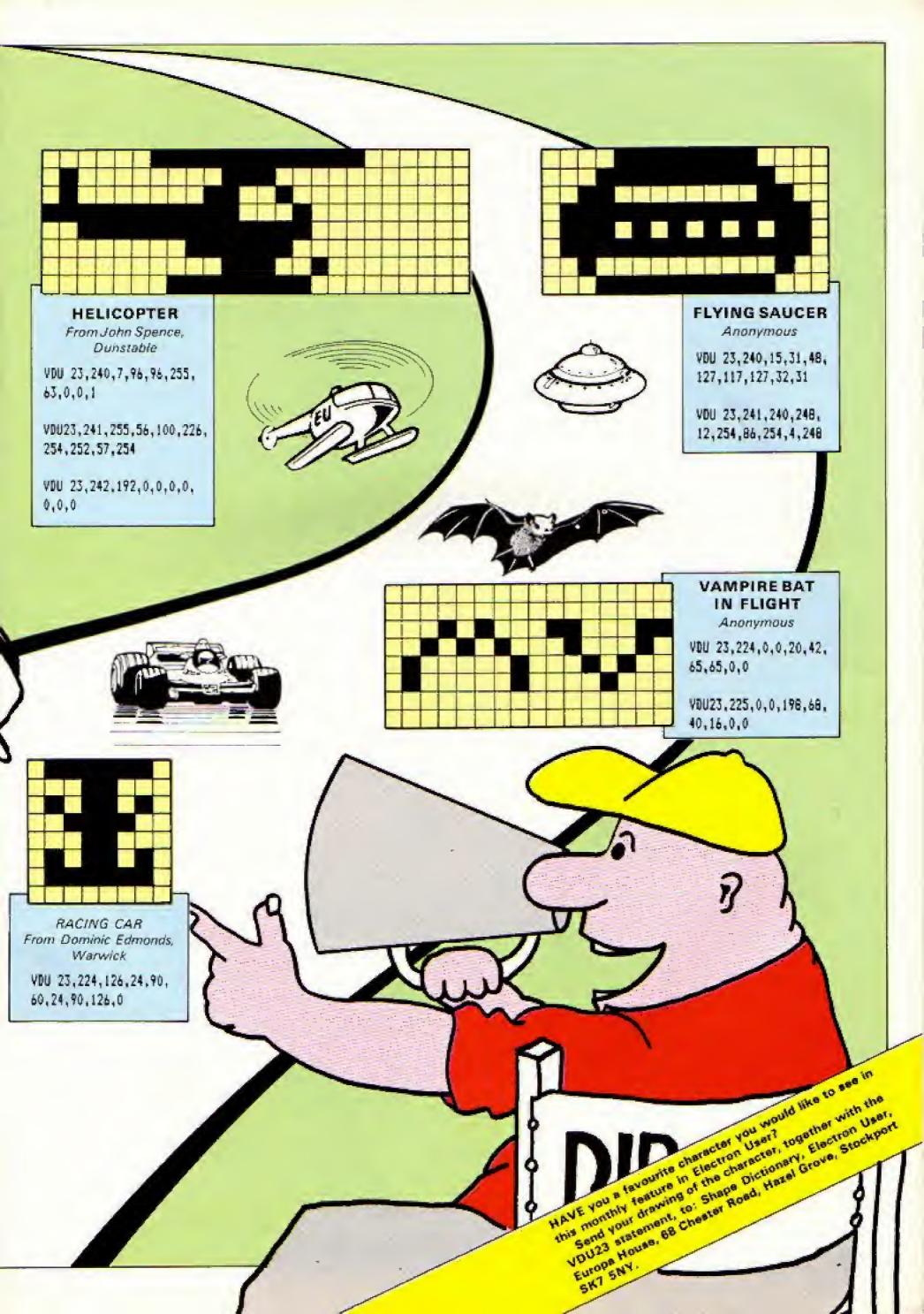
200 PRINTT AB(row, line)

210 FOR delay=1 TO 50 :NEXT delay

220 NEXT row

230 NEXT line

240 ENDPROC



Ajoint presentation by
The Micro User & Electron

The Micro User & Electron

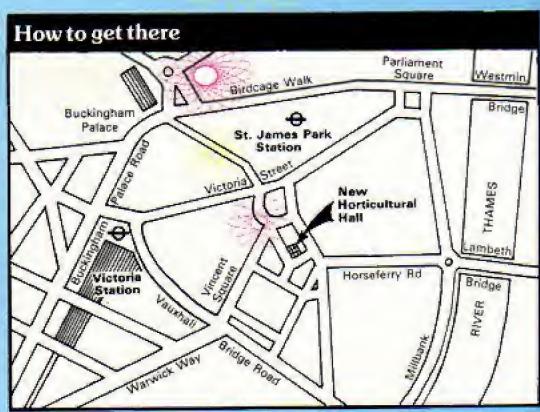
Don't miss the great new for the Electron

Here's your big chance to catch up on all that's been happening recently in the fast-developing world of the Electron and BBC Micro And there's so much new to excite and intrigue you

NEW programs from the fernile minds of Britain's leading software writers – games galore, plus a growing number of new packages for teachers and for industrial and business users.

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Electronics wizards regard both the Electron and the BBC Micro as a challenge to their ingenuity. Their latest creations on display at the Electron and BBC Micro Usar Show will astound and delight you!





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School and College Groups

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Electron & BBC Micro User Show 68 Chester Road, Hazel Grove Stockport SK7 5NY Tel: 061-456 8383

Spring show of all that's and BBC Micro

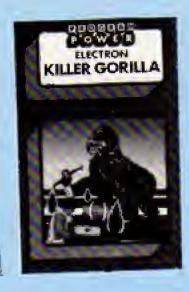


New Horticultural Hall

(Westminster Exhibition Centre)

Thursday to Sunday, March 29 to April 1

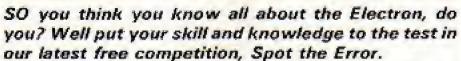








Win 10 top software packs!



No, we don't mean in the magazine, we mean the deliberate errors in the list of variable names below:

- 1 LET new value=45
- 2 LET PRINTER=3
- 3 LET total=234
- 4 LET one+two=27
- 5 LET compchoice=5
- 6 LET isn't=-1
- 7 LET good-guys=4
- 8 LET 1st=-19
- 9 LET oneS="fred"

Some are right, some are wrong. But which is which? Decide for yourself and put ticks or crosses as appropriate in the numbered boxes on the coupon.

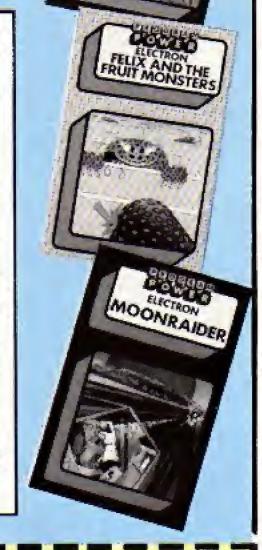
Then complete the sentence that begins "I'm an Electron User because..." in not more than 20 words – the most amusing correct answer will win.

What's the prize? No fewer than 10 pieces of software from Program Power who are rapidly establishing themselves as leaders in the world of Electron software.

These range from classics such as Croaker and Swoop, to the adventures of Felix and the Logo-based program, Draw.

They're all written to the high standard we've come to expect from this company and are guaranteed to delight, amuse and, occasionally, frustrate you.

The closing date is March 28, and the judge's decision is final.



Put your ticks or crosses in these boxes:

1	Ì





6





	-	
5		I
		ı

Q	
3	
	- 1

ELECTR	ON	USER	CONT	EST
--------	----	------	------	-----

I'm an Electron user because . . . (not more than 20 words).

Address

Post to: Electron User Contest, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Outguess the Electron

HERE's the Electron version of an old game - paper, scissors, stone.

Can you outguess the Electron? Type it in and try your luck.

And if you want to mess around with the program, why not make it print out shapes to represent the paper, the scissors and the stone?

You could even send them in to Casting Agency!

But first try the program as it is. Who's the better guesser - you or your Electron?

PROCEDURES

PROCINSTRUCT Prints out the

PROCcompchoose Uses the RND command to get the Electron to decide whether it is paper, stone or

PROCyouchoose Displays the choices available to you

and accepts your answer. PROCresult Decides who has won and prints out the appropriate message.

VARIABLES

compchoice Contains the computer's choice (5, 6, or

> This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on

Page 4 of the February issue.

wraps STONE*

270 PRINT TAB(1,25) "SCISSORS 440 yourchoice=yourchoice-48 cut PAPER"

280 PRINT TAB(1,27) "STONE blunts "

290 PRINT TAB(11,29) "SCISSOR 455 CLS

300 PRINT TAB(3.31) "PRESS

ANY KEY"

310 WAITS=GETS

320 CLS

330 ENDPROC

340 DEF PROCcompchoose

350 compchoice=4+RND(3)

360 ENDPROC

370 DEF PROCyouchoose

375 COLOUR 1 : COLDUR 130 :CLS

380 PRINT TAB(2,5) "You can

390 PRINT TAB(5,10) "1. Paper

400 PRINT TAB(5,15) *2. Sciss ors"

410 PRINT TAB(5,20) "3. Stone

420 PRINT TAB(2,25) "Enter your choice"

430 yourchaice=6ET

450 IF yourchoice (1 OR yourchaice 33 THEN GOTO 430

460 EMBPROC

470 DEF PROCresult

480 COLDUR O :COLOUR 134 :ELS ::

490 PRINT TAB(2,5) "ELECTRON" TAB(12.5) "PLAYER"

500 PRINT TAB(2,6) "########" TAB(12.6) "******

510 IF compensione=5 THEN PRINT TAB(2,10) "PAPER"

520 IF compchoice=6 THEN PRINT TAB(2,10) "SCISSORS"

530 IF compchoice=7 THEN PRINT TAB(2,10) "STONE"

540 IF your choice=1 THEN PRINT TAB(12:10) "PAPER"

550 IF yourchoice=2 THEN PRINT TAB(12,10) "SCISSORS"

560 IF yourchoice=3 "STONE"

PETE

BIBBY



APPRILIPHENT OF THE PARTY OF TH DRAW is a short pro-

Notebook Part 2

10 REM RANDOM DRAW

20 REH (C) ELECTRON USER

40 HODE 5

60 VDU 19,2,RND(7),0,0,0

REPEAT...UNTIL

loop,

runs over

-REM statements-

and over

30 REPEAT

50 VDU 19,1,RND(7),0,0,0

70 VDU 19,3,RND(7),0,0,0

80 count=0

90 REPEAT

100 count=count+1

110 HOVE 0.0

120 x=RND(1279)

130 y=RND(1023)

140 GCOLO, RND (3)

150 DRAW X,Y

160 UNTIL count>100

170 UNTIL FALSE

gram that uses your Electron to fill the screen with coloured lines, over and over again.

There are only 17 lines of program, two of which do nothing. So type it in, run it and try to understand how your Electron is doing it.

'nested" REPEAT...UNTIL loop. This cycles until count is over 100

QUICK on the

Try adding any or all of the following lines: 155 HOVE 1279.0 : DRAW X.Y 156 MOVE 1279,1023: DRAW x,y 157 MOVE 0,1023 : DRAW x.y

50-70

Description

REM statements that give informa-Line No: tion to humans but are ignored by the 10-20

These lines put the whole of the working part of the program in an 30, 170 endless REPEAT . . . UNTIL loop.

This selects Mode 5 and also clears the screen each time round the loop. 40

These pick the three colours which the Electron is going to use to draw the lines. VDU 19 actually chooses which colour is used from a possible selection of 16 (though here the RND(7) restricts the choice to only

seven colours).

80 90, 160 This sets the variable count to zero. These two lines set up another REPEAT . . . UNTIL loop. Each time the Electron goes through this loop count is increased by one. When it is equal to one hundred, that loop finishes and the Electron goes on to line 170.

This line increases the value of count, initially zero, by one each time 100

through the loop.

MOVES the graphics cursor back to the origin. This means each line will 110 start at the bottom left hand side of RND is used to pick random values of

120, 130

the x and y coordinates which mark the end of the line.

GCOL uses the RND(3) to pick which one of the three colours selected by 140 lines 50,60,70 is to be used to draw the line.

This actually DRAWS the line. 150

Notice that the REPEAT . . . UNTIL loop between lines 90 and 160 is entirely contained within the REPEAT ... UNTIL loop formed by lines 30 and 170. This is what is known as a "nested loop

Trever Kaberts

oftware Sur

THE COLUMN THAT TAKES A LOOK INSIDE THE LATEST RELEASES

Great change from zapping aliens

SUPERGOLF Squirrel Software

I'VE never played golf in my life. My only memory of playing anything like it was taking on my dad on the putting green at Gynn Square, Blackpool more years ago than I care to remember.

So you can see that I'm not really all that well qualified to judge how realistic Supergolf, from Squirrel Software, is. I do, however, know a good game when I see one, and Supergolf is just that.

What you get for your money is a gentle and amusing simulation of a golf course, with all 18 holes and the usual hazards such as bunkers, ponds and the wind.

When you load the game the first thing you get is a list of instructions. These are a model of simplicity, but be warned - you can't get back to the instruction page from the main program.

I advise taking notes the first time you run the game, though you'll soon pick up how to play it.

After the instructions page comes the game proper.

The Electron displays one fairway at a time, viewing the course from the side.

It then asks you to select which club you want and what strength shot you are going to use.

At first it's all a matter of trial and error. Do you use a nine iron or the wedge? Do you hit the ball with a force of



from A&F.

first moment.

On the first hole with Supergolf

99 or a more moderate 30?

Soon, however, you learn the uses of all the clubs and are quite happily knocking the ball all over the place.

And in my case it really is all over the place! I don't know why it is, but my ball seemed to have a morbid fascination with every bunker on the course.

Happily I'd chosen the one player version of the game so when I displayed my score card at the end of each round I was the only person I embarrassed.

The game was fun, entertaining and engrossing. I may never play golf but I'll certainly be playing Supergolf again. It makes a great change from zapping aliens, even if I'm not very good at it.

Mind you, I do have an excuse for my poor performance. I was feeling under par at the time.

Nigel Peters

PHARAOHS TOME

have a go at Pharoahs Tomb,

the "adventure style game"

I was entranced from the

The game isn't really a true

adventure. It's more a cross

between a series of anagrams,

mastermind type puzzles and

A race against the clock is

The idea is that you enter

an arcade action game.

thrown in as well.

the Pharoah's tomb in order to get hold of his mask and 500 pieces of gold.

When you've got them you can return to the start (if you can find your way) and escape.

At least that's what the instructions say, I must admit that I haven't got that far. I usually starve to death.

On your way through the tomb you are attacked by spiders and mummies, have to solve riddles to open doors, and rush around collecting silver and gold coins.

With the coins you can buy

useful items like lances,

swords and bows and arrows

as well as food.

Sadly, you can't bribe anyone to tell you how to get

I could tell you more about the game, but why should I give away my hard won secrets? Find out for yourself!

It's great fun. The instructions are straightforward. though the game seldom is.

It's the type of program that has people looking over your shoulder giving "helpful" hints. If you are tired of all-action games but are a bit wary of a full blown adventure, then Pharoahs Tomb may just meet your needs.

And if you do manage to escape, let me know how.

Trevor Roberts

Power packed chess program

ELECTRON CHESS Program Pawer

THE sheer size of the task is astonishing - how does one put a game as complex as chess into a micro?

How Program Power man-

Starving for a game

PHARAOHS TOMB A&F Software

I'M not much of an adventure game freak, having spent too many hours lost on the London Underground for caverns to hold much fascination.

So it was with a distinct air of foreboding that I decided to



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What Makes You Tick (TP)	£5.17

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Wilmslow Micro Centre, 62 Grove Street, Wilmslow, Cheshire. Tel: 0625 530891

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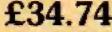
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£173.00 Carriage £7

Stocks are limited, so it's very much a case of first come first served. We promise that no cheques will be cashed until the machine is despatched.

Electron Dust	Cover	44444	£2.56
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From Page 21

aged to do so as well as this is truly remarkable. It is a version I found totally absorbing, and one which I most certainly recommend.

On loading, which was straightforward and presented no difficulty, a menu of options is presented.

Each option is most carefully explained on the cassette inlay, and they enable one to set the parameters for any chosen game.

The colours of the pieces and/or the board are easily changed to any combination, so invisible chess becomes possible – and very difficult!

The most obvious choice from the menu is Play, but even then various other decisions have to be made.

It is possible to play against the Electron, to have the computer play itself, or to use the micro simply as a medium through which two human opponents may do battle.

There are several skill levels, although one obviously has to trade power against speed of response.

Average times are given for various levels, with the ninth grade taking about three hours per move.

At my standard of chess that would rival watching the



proverbial paint dry.

At lower levels the computer still plays a decent game. It inclines to be orthodox in style, although it enjoys forays with the Queen.

One very helpful feature is the chance to retract a bad move. In fact, by clever use of the built-in facilities, it is even possible to swap sides midgame.

It is also possible to set up any required board layout to allow analysis of various ideas. I found these powerful options to be a most useful aid with my 10-year-old chess club members at school.

My favourite choice of play was Blitz Chess, in which one is given only a limited time to make a move. This time can be set as low as 10 seconds, which certainly stimulates the adrenalin.

If no move is made in time the computer claims another go. Here the computer has a great advantage, being troubled with neither fatigue or panic, nor by the telephone ringing.

Obviously any such complex program is almost certain to include the odd bug, and this is no exception.

When playing Blitz Chess, as explained before, the turn reverts to the computer if no move is made within the time allowed.

In one case I was in check but made no move within the limit. The computer promptly took my king and told me I was still in check!

In another game, with the micro playing itself, play reached a state where the board alternated between two positions.

This continued for over a quarter of an hour, with the same yoyo moves, until I put an end to the pieces' misery.

However, with these few minor problems put to one side, all the features of chess are faithfully reproduced in this version, including castling and en-passant.

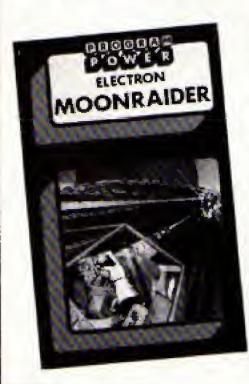
Illegal moves are disallowed, as well as a very occasional legal move, and the whole gives the feeling of a well-designed program.

It offers good value at the price, and its range caters from beginner to advanced club player – and probably beyond.

Phil Tayler

Action to test arcade fanatics

YOU are the commander of a squadron of three fast and highly manoeuvreable space attack craft, ordered to raid an alien base on the Moon.



MOONRAIDER Program Power

The aliens, understandably miffed at this, set up a series of defensive zones, each more difficult than before, which you must negotiate.

The first three screens depict hilly landscapes, thickly populated by radar stations, anti-aircraft batteries and missile silos.

Also dotted about are enemy tankers – vital to your mission, for by hitting them with your bombs you gain a much needed boost to your fuel reserves.

This is necessary to enable you to reach your own tanker, which is sited between stages.

Beware of the space mines that surround your tanker – these aliens don't miss a trick. Stages two and three have flying bombs and fireballs just to keep things interesting.

Stage four takes you over the highlands, sown with missiles and not an enemy tanker in sight until the very end. If you miss this, it's curtains!

Refuel once more and you're through to the final obstacle – a long winding cavern with sharp bends and vertical shafts.

No problem with fuel here, because flocks of enemy tankers block your path. Having said that, none but the very skilled will make it through the cavern.

The enemy base lies tantalisingly beyond, though some may never see it.

Good graphics, a limitless supply of laser bolts, bombs and poachable fuel make this a satisfying and compulsive game.

Skillful use of the faster/ slower key makes evasive action easier.

Use of this key while refuelling means that you can take on more fuel, and its use is vital while flying through the caverns.

One of the nice features of the program is you can skip stages by selecting games one to five and set the difficulty by selecting A to D.

A good value game, crammed with action and needing skill to test the most ardent arcade fanatic. A recommended version of the old classic.

Adam Young

ELECTRON USERS!

Don't miss March's

ode de la company de la compan MICRO USER

 It's the biggest issue ever, crammed with fascinating ideas and programs

IN ITS FEATURE PACKED PAGES YOU'LL FIND

- * MAZE MUNCH: our rip-roaring version of the arcade blockbuster.
- * DENARY DERRICK: simple numbers for infants, the enjoyable way.
- * BEGINNERS: colour on the BBC Micro. We show you how easy it is.
- * BIRTHDAY: we celebrate our anniversary with a fun packed game the whole family will love.

And, of course, most of the many programs featured in The Micro User can be easily modified for the Electron.

All in all, if you're an Electron User, it makes sense to also buy The Micro User.

The March issue is now on sale at your newsagents.

BOOKSHELF

Brainteasers for the BBC and Electron Computers, Gewevieve Ludinski, Phoenix Publishing Associates

THE subtitle of Brainteasers for the BBC and Electron Computers is Programs to Puzzle and Amuse, and this just about sums it up.

The book is a collection of 29 program listings, each one an interesting and amusing challenge.

I must admit it made a nice change to come across a collection of games that didn't rely too heavily on my ageing raflexes.

No, there were no hordes of alien nasties whizzing across the screen, just gentle, intriguing challenges.

The program types range from mazes and safe cracking to mathematical sequences and pattern sorting.

I particularly liked the idea

At first sight they looked a little jumbled and cluttered but I had little difficulty entering them.

Well, no more than usual. And the games were well worth the effort of typing them

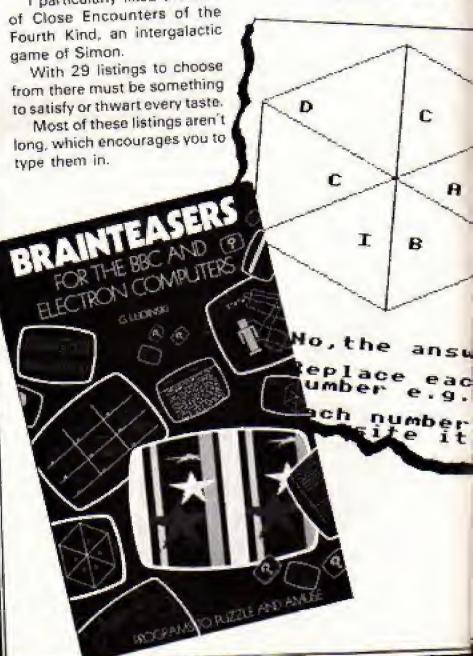
A really nice feature of the book is that each listing has a few paragraphs of program hints before it.

These greatly add to its value, giving explanations of various techniques used in the programs and hints on how to make them easier or more difficult. I'd love to know who wants them to be harder!

There's only one thing that I'd complain about. One of the programs I ran gave me an IQ rating. It must be wrong, I'm far more intelligent than that!

Despite that, it's an enjoyable book, far from the usual run of the mill set of games listings. If you like puzzles and you've got an Electron, then you'll like this book.

Trevor Roberts



Brainteasers listing

```
I REM THIS PROGRAM IS
      FROM
   2 REM BRAINTEASERS FOR
      THE
   3 REM BBC AND ELECTRON
   4 REM COMPUTERS BY
  5 REM 6. LUDINSKI
  10 REM HEXABON PUZZLE
 20 REM COPYRIGHT (C) 6. LUDIN
    SKI 1983
 30 MODE 4
 40 DIN S(8), IP$(255)
 50 CLS
 60 VDU 23,224,0,1,2,4,136
    .80.32.0
 70 TE=0
    : CR=0
    :TIME =0
 80 CLS
 90 TE=TE+1
100 IF TE=11 OR TIME >=
     20000
    THEN GOTO 670
110 REM
120 REM WORK GUT SEQUENCE
130 REM
140 5(1)=0
150 S(2)=INT (RND(1)+9+1)
160 IC=INT (RMD(1)+4+1)
170 M=INT (RND(1)+5)
180 FOR 1=3 TO 8
190 IF W=0
    THEN S(1)=2+S(1-1)-S(1-2)
    +IC
    :MS$="The interval increa
    ses by "+STR$ (IC)+"
     each time"
200 IF W=1
    THEN S(1)=S(1-1)+S(1-2)+1
    :MS#="Each number is
     the sum of the previous
      the plus "+STR$ (IC)
210 IF W=2
    THEN S(1)=S(2)^(1-1)
    :MS$="Each number is
     "+STR$ (S(2))+" to the
     power of 2,3,4,5,6 and
220 IF W=3 AND 1 > 5
   THEN S(3)=5(2)
    :S(4)=1C
    :S(5)=INT ((S(2)+IC)/2)
    :S(1)=S(2)+S(1-3)
    :MS$="Each number is
     "+STR# (S(2))+" times
     the number
                      opposit
    e it*
230 IF W=4 AND I > 5
    THEN S(3)=$(2)
```

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

```
:S(4)=IC
                                      CHR$ (64+5(5))
    :S(5)=INT ((S(2)+IC)/2)
                                      :PRINT TAB(18,14);
    :S(I)=IC+S(II-I)
                                      CHR$ (64+5(6))
    :MS$="The numbers on
                                       :PRINT TAB(16,10);
     the left hand side of
                                      CHR$ (64+5(7))
     thewheel are "+STR$ (IC)
                                  430 REM
    +" times the numbers
                                  440 REM INPUT ANSWER
     on the
               right hand
                                  450 REN
     side"
                                  460 II=L
240 NEXT I
                                  470 [P$(IX)=INKEY$ (10)
250 FOR I=1 TO 13
                                      : IF IP$([X)=**
    PRINT
                                       THEN PRINT TAB(0,1);
    :NEIT I
                                      INT (FIME /100)
260 REM
                                      :6010 470
270 REM DISPLAY NUMBER WHEEL
                                  480 PRINT TAB(IX+13,5); IP$(IX
280 REM
                                      1:3
290 X1=640
                                      : [X= [X+1
    : Y1=704
                                      : 1P$(1X)=6ET$
300 X2=X1+259.81
                                      : IF IP$(IX) () CHR$ (13)
    :Y2=Y1+150
                                       THEN GOTO 480
    : Y3=Y1-150
                                   490 [#=""
    : XJ=X1-259.81
                                      :FOR I=1 TO II-1
310 MOVE X1, Y1+300
                                      :[$=]$+[P${]}
320 DRAW X2, Y2
                                      : NEXT I
330 DRAW X2, Y3
                                  500 REN
340 DRAW X1, Y1-300
                                  510 REH CHECK ANSWER
350 DRAW X3, Y3
                                  520 REM
360 DRAW X3, Y2
                                  530 #FX 15.1
370 DRAW X1, Y1+300
                                  540 IF LE=0 AND ABS (
380 DRAW X1, Y1-300
                                      VAL (I$) - S(8)) (=
390 NOVE 12, Y2
                                       LEN (14)/2
    :DRAW X3, Y3
                                      THEN COLOUR 1
400 HOVE 12, Y3
                                      : VDU 8
    : BRAW X3.YZ
                                      :PRINT TAB(19,5);
                                      CHR$ (224)
410 IF S(8) ) 26
    THEN LE=0
                                      : CR=CR+1
    :PRINT TAB(21,5);5(3)
                                      : COLOUR 3
    :PRINT TAB(23,10);S(4)
                                      :6070 610
    :PRINT TAB(21,14);S(5)
                                  550 IF LE=1 AND (I $= CHR$ (64+
                                      S(8)) DR 1$=CHR$ (65+S(8)
    :PRINT TAB(14,14);5(6)
    :PRINT TAB(12,10);S(7)
                                      110:
                                      THEN COLDUR 1
420 IF S(8) (= 26
                                      a VDU 8
    THEN LE=1
                                      :PRINT TAB(19,5);
    :PRINT TAB(21,5);
                                      CHR# (224)
    CHR$ (64+5(3))
                                      : CR=CR+1
    :PRINT TAB(23,10);
                                      : COLOUR 3
    CHR$ (64+S(4))
                                      :60TO 610
```

:PRINT TAB(21,14);

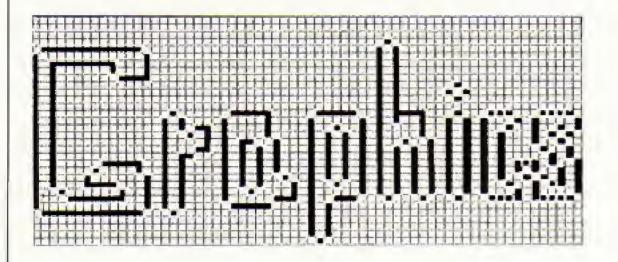
```
answer = ";
 570 IF LE=0
     THEN PRINT S(8)
 580 IF LE=1
     THEN PRINT CHR$ (64+S(B))
 590 IF LE=1
     THEN PRINT
     :PRINT "Replace each
      letter by its position
          number e.g. 1 for
      A,2 for B etc."
 600 PRINT
     :PRINT MS#
610 PRINT TAB(0,30); "Press
      Return to continue*
620 INPUT AS
630 60TO 80
640 REM
450 REM SCORE SHEET
660 REM
670 CLS
     :PRINT
680 PRINT "Number of puzzles
        completed = ": TE
690 PRINT
    :PRINT "Number correct
      = *: CR
700 PRINT
    iPRINT "Time taken =
      "; INT (TIME /100);"
     seconds"
710 IQ=INT (CR+100/5.3)
720 PRINT
    :PRINT "Your IQ level
      (numeracy) = ":10
730 PRINT
740 IF CR >= 7
    THEN PRINT "This is class
    ed as SUPERIOR (upper
     101) "
    :6010 770
750 IF CR = 6
    THEN PRINT "This is class
    ed as 6000 (upper 20%)*
    :60TO 770
760 IF CR = 5
    THEN PRINT "This is class
    ed as FAIR (upper 60%)"
770 REM ...
THIS game is just one of 29
 testing listings that appear
```

THIS game is just one of 29 testing listings that appear in Brainteasers for the BBC and Electron Computers, by Genevieve Ludinski, price £5.95.

Our thanks go to the publishers, Pheonix Publishing Associates, for their permission to use the

hexagon puzzle.

560 PRINT TAB(0,21); "No, the



IN the last article we met the seven different modes that the Electron can use. We talked about the effect selecting each mode has on the screen display and the amount of memory available for our programs. We also covered how many colours could appear on screen at any one time. What we didn't say was how to get these colours.

You'll have noticed that whenever we change mode with:

MODE 1

or:

MODE 5

we end up in black and white. In fact, to be technical, we end up with white letters on a black background.

This month we'll be dealing with ways to change the colour of the letters we use and the backgrounds we display them on. We'll be exploring the colour commands that affect the text we print.

The reason why we've only had white text on a black background up until now is that these are the default colours of each mode.

All this means is that these are the colours that the text will be printed in unless you do something about it.

If you don't tell the Electron that you want a different colour of letter on some other colour of background, you get white letters on a black background by default.

One idea to grasp firmly is that each letter or character printed by the Electron on the TV screen has a background and a foreground.

Figure I shows this for the letter A. Every text character that we put on the Electron's TV screen consists of a foreground, in the shape of the

COLOUR BY HUMBERS

MICK MACMANUS continues to explore the world of Electron graphics

character printed on a square background,

Up until now we've always had a white foreground colour which has stood out against the black background.

Incidentally, you might notice that the black of the screen isn't just one big black mass but is made up of lots of little black squares, all of them the background to a character. Later, we'll see what this means for our text displays.

Now let's see if we can change the foreground colour. Type in:

HODE 5

and press the Return key.

The Electron is now in Mode 5 which, as you'll see from Figure II, is a four colour mode.

If you type in a few letters at random, you'll see that at the moment we have the same old white letters against a black background.

These are the default colours, as I told you. However, we're not stuck with these. Mode 5, is a four colour mode so let's explore the other two colours.

Get rid of the line you've been typing in, by pressing CTRL and U at the same time, and enter:

COLOUR 1

Now see what happens when you type some characters. The background colour is still the same boring black, but the foreground, the bit that makes up the letters, is red. When you get tired of red letters then enter:

COLOUR 2

and you'll find that you've got yellow letters.

As you can see, Mode 5 (and, incidentally, Mode 1) is a four colour mode and the colours are black, red, yellow and white. We pick the foreground colour of our text using the COLOUR command followed by a number.

It is this number, known formally as the logical colour number, which specifies the colour that is used.

I prefer to call the number the colour code number, because that is all it is, a code number that is attached to a colour.

The code numbers and the colours that they stand for are:

- 0 black
- 1 red
- 2 yellow
- 3 white

Run Program I to see the effects of the COLOUR command with the different code numbers.

- 10 REM PROGRAM I
- 20 MODE 5
- 30 count=0
- 40 REPEAT
- 50 colour=count MOD 3 +1
- 60 COLOUR colour
- 70 PRINT
 - :PRINT :
- 80 PRINT "This is COLOUR
 - ": colour
- 90 PRINT
 - :PRINT :
- 100 PRINT "PRESS ANY KEY"
- 110 WAITS=BETS
- 120 count=count+1
- 130 UNTIL FALSE

As you see this prints out its message in the three foreground colours available in Mode 5. If you change line 20 to:

20 MODE 1

you'll see that the same colour codes produce the same colours in Mode 1, the other of the Electron's four colour modes.

Can you guess why the last program didn't bother with the colour code of 0? If you can't, enter:

COLOUR O

and see what happens when you type.

Printing a black foreground

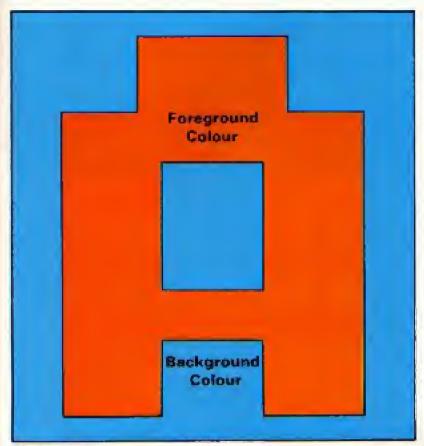


Figure 1

on a black background doesn't add to the clarity of a display!

Press Escape and the Electron will take you back to good old black and white.

But you might ask, that's only the foreground. What about the background? Can you change its colour? The answer is you can.

You use the COLOUR command as before. But this time the code for each colour is 128 higher. This gives:

128 black background 129 red background

130 yellow background 131 white background

As you can see, the colour code for the background is the same as the colour code for the foreground PLUS 128.

Let's change the background colour to red with:

COLOUR 129

This will cause all the characters we now print out to have a red background. Try it and see.

Notice that it is only the background of the characters we print after the COLOUR command that appear red.

Not all of the background goes red at first, only the square backgrounds around the letters.

The original background colour remains the same wherever there is nothing written on it. In this case, since we just pressed Escape, it is black.

This is because the black background we have when we enter a Mode is made up by filling the whole of the screen with spaces.

These spaces are characters that consist of just a square of background colour, with no foreground.

in the normal course of



Logical number Fore Back- ground (on entering media)			interest of the	nd actual colours)	
0	128	(on entering mode) Black	Fore	Rack	
-	129	White	10	128	Black Black
				129	Red
200			2	130	Green
TODES 1	. 5		3	131	Yellow
ogical nun	ber		14	132	Blue
POTA- D-		Colour	5	133	Magenta
round gro		(on entering mode)	6	134	Cyan
12		Black	1	135	White
2 13	-	Red	8	136	Flashing black-white
3 131		Yellow	9	137	Flashing red-cyan
131	-	White	10	138	Flashing green-magenta
			11	139	Flashing yellow-blue
			12	140	Flashing blue-yellow
Tr.		-	14	141	Flashing magenta-green
the logical	colour n	umbers on entering	-	142	Flashing cyan-red
< ate 9120	the actu	umbers on entering later colour numbers.	13	143	Flashing white-black



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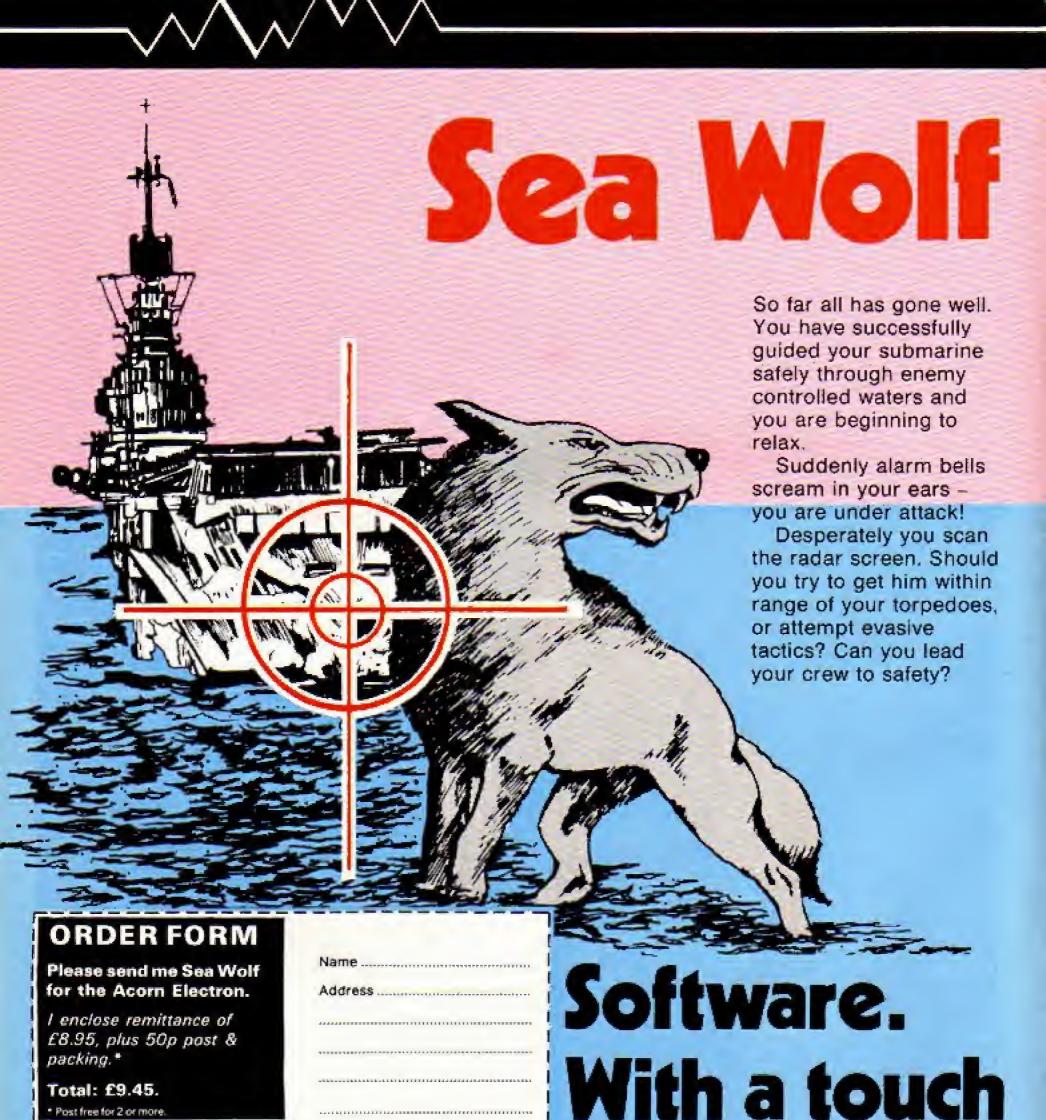
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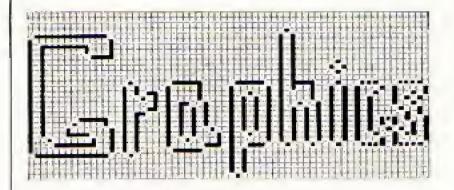
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of brilliance





From Page 27

events we write over these squares with our text characters which usually have a black background by default.

This means that the joins between the edges of the characters we've printed and the original black squares that haven't been covered by our text characters don't show.

When we change the background colour to, say, red the joins do show, producing the ragged effect where the old and new background colours clash.

Happily this only lasts until the screen starts scrolling upwards to make room for a new line when it's full. Now all the spaces will be the new background colour.

Alternatively we can clear the screen with CLS and the whole background will go to the new colour.

To see the effects of changing the background colour run Program II. Do you understand why there is the ragged effect at first, but later the background is an even colour?

And why don't I change the background with COLOUR 131?

- 10 REM PROSRAM II
- 20 MODE 5
- 30 count=0
- 40 REPEAT
- 50 backcolour=count MOD 3 +128
- 60 COLOUR backcolour
- 70 PRINT
 - : PRINT :
- 80 PRINT "This is background COLOUR ":backcolour
- 90 PRINT
 - : PRINT :
- 100 PRINT "PRESS ANY KEY"
- 110 WALTS=BETS
- !20 count=count+!
- 130 UNTIL FALSE

Try running Programs I and II in Mode 1, the other four colour mode. Of course, you'll have to change line 20 in each program to read MODE 1.

Now let's move on to consider Mode 2, the 16 colour mode. You can change the foreground colour and the background colour in just the same way as before using COLOUR with the appropriate number.

The difference is that now you have 16 logical colours, numbered from 0 to 15.

Run Program III and you'll see the foreground colours available in Mode 2.

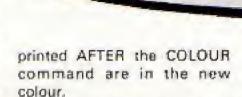
- 10 REM PROGRAM III
- 15 MODE 2
- 20 FOR x=0 TO 15
- 25 COLOUR x
- 40 PRINT "This is colour
 - *ix
- 50 PRINT
- 60 NEXT x
- 70 WALT#=GET#
- 75 COLOUR 7
- 80 FOR x=0 TO 15
- 90 COLOUR 128+x
- 95 PRINT
- 100 PRINT "Background"; 128+x
- 120 NEXT x

Just press any key and you'll see the background colours as well.

You'll notice that, along with the new colours you get, the colours coded from 8 to 15 are flashing colours. All the codes for the colours are shown in Figure II.

The flashing colours can be very useful for simple animation as we'll see in the next article. As it is, just have fun using the range of colours in Mode 2 to enliven your text.

Now let's go back to Mode 5 for a while. One point to notice is that when you use the COLOUR command colour, only the text or backgrounds



What

The command doesn't change the colour of any of the text that's already been printed. You wouldn't expect it too would you?

Yet some colour commands we'll come across later do have this backwards effect on the colours on the screen. Still, that's for later on.

Program IV is a rather silly program for adding two numbers. I've included it to show how you can have all four colours on the screen at one time, enlivening your display.

10 REM PROGRAM (V 20 MODE 5

30 COLOUR 129

CLS 40 COLDUR O

50 PRINT TAB(6,5) "What is"

50 COLOUR 130

70 PRINT TAB(6,8)"

80 PRINT TAB(4,8)" 3+8

90 COLOUR 131

100 PRINT TAB(6,10)"

110 PRINT TAB(6,10)" =11

120 VDU 23,1.0;0:0:0

Line 20 puts the Electron in Mode 5 while line 30 puts the background colour to red (128+1), the CLS flushing the screen to this colour.

Line 40 selects black as the foreground colour of any text we might print and line 50 prints the question. After the question is printed, line 60 changes the background colour to yellow. Now any text printed will have a yellow background.

Line 70 prints a row of spaces which have the background colour yellow. This produces a nice yellow box in the otherwise red screen.

Line 80 then prints the sum in the same place.

Line 90 picks a white background colour, line 100 prints a white box and line 110 overprints this with the answer.

Line 120 just switches off the flickering cursor.

There you are, four colours on screen, making a nice display.

The more observant of you will realise that you don't need lines 70 and 100 as the following lines completely overwrite them.

However with other programs this might not always be the case, so I put the lines in to show how to put boxes of colour on the screen.

And that about brings things to an end for this month.

We've covered quite a lot and I'd advise you to mess around with different combinations of background and foreground colours in Modes 1, 2 and 5 until you get used to them,

But what about the two colour modes? Are we stuck with the default logical colours, black and white?

No, we're not, but how to change them can wait until my next article.

Books for the Electron User

TAKE OFF WITH THE ELECTRON AND BBC MICRO



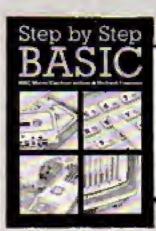
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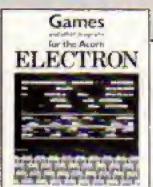
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20 programs covering the whole range from logic games to arcade favourites, along with graphics displays and usoful utilities.

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Go beyond Basic and learn to speak to your Electron in its own language with this simple but thorough introductory book.

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A thoughtful, thorough guide to good programming techniques.

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IT is said that Michelangelo drew a perfect circle freehand to gain entry to the With the aid of your local art academy. Electron you can draw circles which, while not being exactly perfect, will be produced a bit more This program demonsquickly than his. trates a fast procedure for drawing polygons (many

If you include enough sides the polygon begins to sided figures). look like a circle, so you get two procedures for the

If you want to include the procedure in your own price of one. programs it is to be found in The program also lines 750-900.

illustrates the method of fast animation by pallet spinning. This is in lines A drawing is first made using different logical 590-740.

colours for each line. Then it is brought to life by making one colour white After a short pause this and the rest black. colour is also swiched to black and the next one in the sequence is made white allowing the next line to appear almost instantan-This creates the illusion eously.

See if you can add to the of rapid animation. program using the polygon procedure to create your own effects.

BY MIKE COOK

TO REM FUN WITH POLYGONS BY MIKE COOK

20 THE SEA RUNS DRY=FALSE

30 REPEAT

40 HODE 6

50 PRINT TAB(6.5); "THE ELECTRON USER PRESENTS

60 PRINT TAB(0,10); "FUN WITH POLYGONS"

70 PRINT "By Mike Cook"

80 PROC_SHOW

90 MODE 0

100 VDU 23,1,0;0;0;0;0;

110 VOU 19,1,0,0,0,0

120 FOR NX=3 TO 10

130 VOU 19,0,RND(6),0

,0,0

140 FOR RX=30 TO 500

STEP 60

150 PROC POLY (640,512

AX, NX)

160 NEXT

170 CLS

180 NEXT

190 MDDE 2

200 VDU 23,1,0;0;0;0;0;

210 FOR CX=1 TO 15

220 GCOL 0,15-CY

230 PROC_POLY(640,512 , CX+34, CX+2)

240 NEXT

250 PROC_SHOW

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

260 PROC SPIN(14)

270 MODE 0

280 VDU 23,1,0;0;0;0;0;

290 FOR AX=1 TO 3

300 CLS

310 FOR BI=1 TO RND(15)+6

320 PROC_POLY(RND(1280)

,RND(1024),RND(400)

,RND(10)+2)

330 NEXT

340 PROC SHOW

350 NEXT

360 MODE 0

370 VDU 23,1,0;0;0;0;0;

380 FOR XX=40 TO 840

STEP 25

390 PROC POLY(11,512,11/2

, (XX/20)+10)

400 NEXT

410 PROC_SHOW

420 MODE 2

430 VOU 23,1,0;0;0;0;0;

440 CZ=1

450 FOR RAI=10 TO 800

STEP 12

460 GCOL O,CI

470 PROC_POLY(640,512

,RAI, (RAI/20)+10) 480 CI=(CI+!) AND 15

490 IF CX=0

THEN CX=1

500 NEXT

510 PROC SPIN(2)

520 PROC SHOW

530 UNTIL THE SEA RUNS DRY

540 DEF PROC_SHOW

550 TIME =0

560 REPEAT

570 UNTIL TIME > 500

580 ENDPROC

590 DEF PROC_SPIN(SX)

600 FOR AX=1 TO 15

610 VDU 19,AX,0,0,0,0

620 NEXT

630 TIME =0

640 REPEAT

650 TX=TIME

660 BX=(AX+1) AND 15

670 IF BX=0 THEN BX=1

680 VDU 19,AI,0,0,0,0

690 VOU 19, BZ, 7, 0, 0, 0

700 AZ=BZ

710 REPEAT

720 UNTIL TIME >TX+5%

730 UNTIL TIME > 2000

740 ENDPROC

750 DEF PROC POLY(XX,YX

RY, NI)

760 LOCAL LII,LYI,C,TII , TYZ, C1, 51, AZ

770 C=20PI /NZ

780 C1=CDS (C)

790 51=SIN (C)

800 LII=XI+RI

BEO LYZ=YZ 820 HOVE LXX LYX

830 FOR AX=1 TO NX

840 TXX=XX+(LXX-XX)+C1-(LYX

-YZ)+S1

850 TYX=YX+(LXX-XX)+S1+(LYX

-YX) +C1

860 DRAW TXX, TYX

870 LXZ=TXX

880 LYX=TYX

890 NEXT

900 ENDPROC

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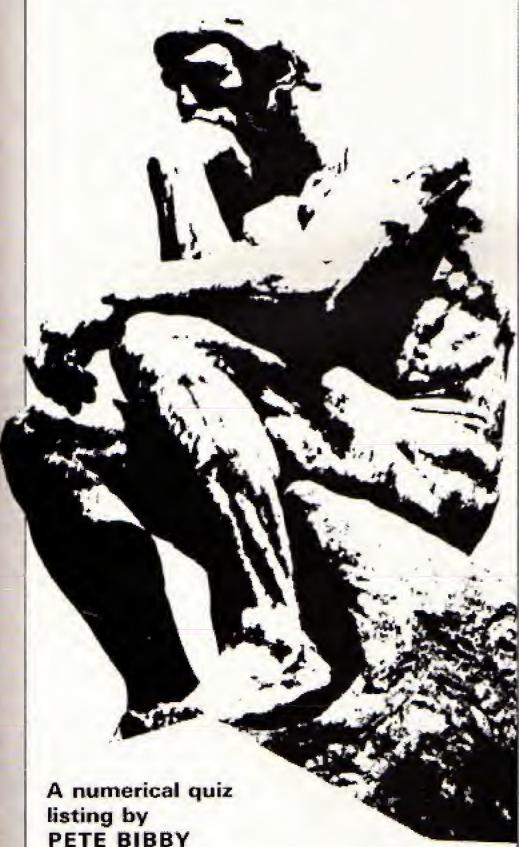
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When and if you get 12 right in a row then the sums become easier but the time period gets shorter!

Oh, yes, we forgot to tell you – you're also racing the clock. Good luck!

10 REM COUNTER 330 IF answer(>VAL (attempt 20 REM (C) ELECTRON USER THEN PROCLOSE 30 MODE & ELSE PROCright 40 VDU 19,0,4,0,0,0 : ENDPROC 50 VBU 23,1,0;0;0;0 340 ENDPROC 60 difficulty=1 350 REM ************** :turn=! ********** 70 CLS 80 PROCERY 360 DEF PROCLOSE 370 SOUND 1,-15,4,10 90 END 100 REM ################# 380 CES 110 DEF PROChumber 390 IF test=-! THEN PRINT TAB(3,5) 120 level=turn 130 REPEAT "Time up, you lose!" 140 IF Tevel >12 ELSE PRINT TAB(3.5) THEN level=level-12 " Wrong, the answer 150 UNTIL level <=12 was ";answer 160 IF level (=12 400 FRINT TAB(3,10) "Still, THEN number (=RND (9999) you got ";turn-1; :number 2=RND (9999) * right,"

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

410 PRINT TAB(3,(5) "Enter

Y if you'd like anothe

170 IF level(=9

THEN number 1=RND (999)

:number 2=RND (999)

180 IF level (=6 420 INPUT TAB(38,15) gos THEN number (=RND (79) 430 IF go\$="y" OR go\$= : number 2=RND (99) 190 IF level(=3 THEN CLS : turn=1 THEN number (=RND(9) anumber 2=RND(9) : PROCtry 200 ENDPROC 440 ENDPROC 450 REM ************** 210 REM ************* 220 DEF-PROCERY 460 DEF PROCright 470 PRINT TAB(17,13) "Correc 230 PROChuaber 240 PRINT TAB(3,5) "What 480 ENVELOPE 2,2,8,0,0 is the result of" 250 PRINT TAB(28,5); number 1 ,255,0,0,126,0,0,-126 ;" + ";number2;" ?" ,126,126 490 SOUND 1,2,4,15 260 PRINT TAB(3,20) "Enter 500 FOR N=1 TO 2000 the answer and press :NEXT N Return" 270 test=INKEY (1000/diffic : CLS ultyl 510 difficulty =1+ turn 280 IF test=-1 DIA 15 520 turn=turn+1 THEN PROCLOSE : ENDPROC 530 PROCERY 290 PRINT TAB(19,23) 540 ENDPROC CHR# (test)

300 INPUT TAB(20,23) rest\$

310 attempts=CHR\$ (test)+re

320 answer=number1+number2

This listing is included in this month's cassette tape offer. See order form on Page 45.

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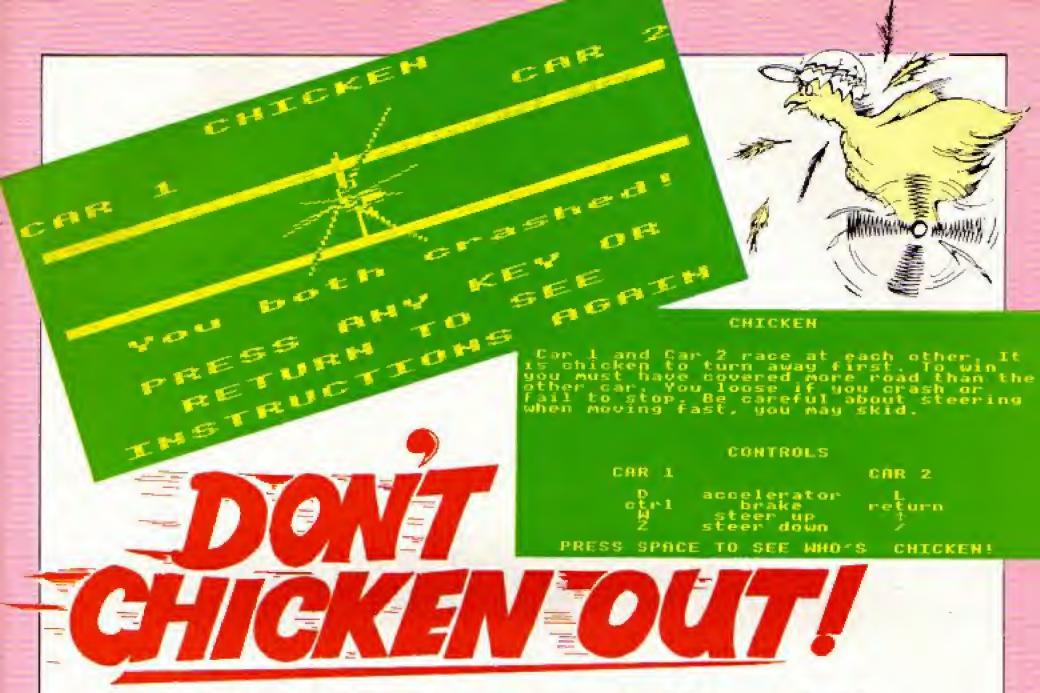
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It's simple to play, and all the instructions are in the game. Just climb into the driver's seat, fasten your safety belt, and away you go.

By ERIC H. CRISP

Full listing starts on Page 53

PROCEDURES

PROCInitial: Initialises variables and car positions and sets up the screen.

PROCInstruct: Initialises the characters, dimensions the arrays and gives instructions.

PROCMove(n): Moves car n to a new position unless stopped.

PROCPlay: The main procedure. Continues until both cars have stopped.

PROCReadkeys: Reads the keyboard and updates "speed" and "steer" accordingly.

PROCResult: Prints the result and waits for the next game.

PROCStatus(n): Reports what happened to car n.

PROCStopped(n): Handles the explosion if cer n has crashed. PROCTest: Tests for a collision.

PROCTest1(n): Tests car n for finished, skidded, ditched or run out of road.

PROCWinner(n): Decides on and prints the winner if both cars stopped successfully.

VARIABLES

car: Flag to indicate which car has stopped. (Values 0=none, 1=car1, 2=car2, 3=both cars.)

collision: Flag to indicate a collision.

count(n): Determines how far car n's explosion has progressed.

distance(n): Records distance travelled by car n before changing direction.

ditch: Flag to indicate which cars have run into the ditch. (See "car" for values.) end: Whether to start another game (0) or rerun with instructions.

going: Flag to indicate which cars have finished moving and exploding. (See "car" for values.)

1: Loop counter.

 n: Local variable for procedures telling them which car is to be considered.

skid(n): The skid speed and direction for car n.

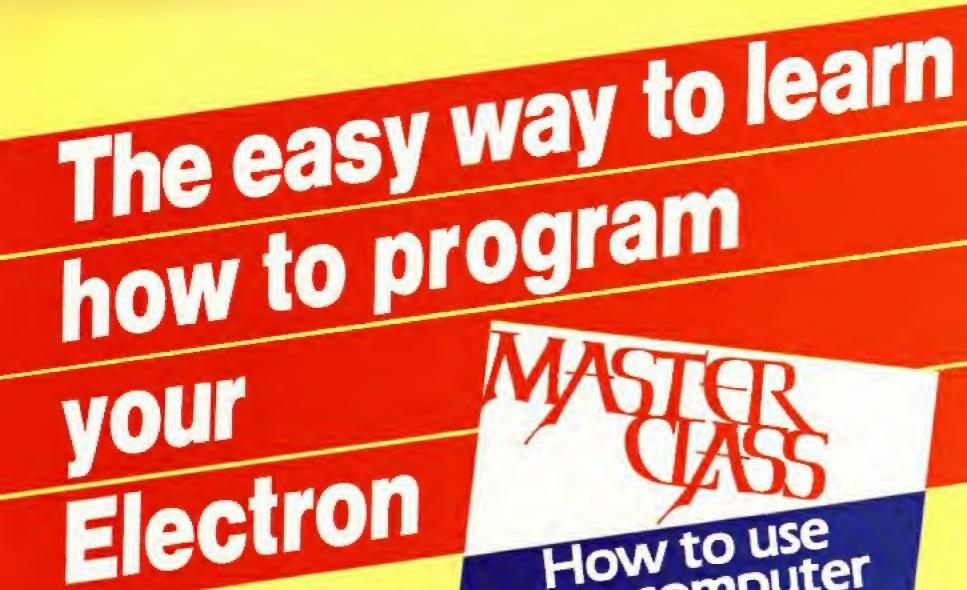
speed(n): Car n's speed.

spin: Records which cars have skidded. (See "car" for values.)

steer(n): Car n's steering speed with direction.

wall: Flag to indicate which car has run out of road. (See "car" for values.)

x(n),y(n): x,y coordinates of car n.



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AVERAGE is a simple 24 line program that will give you the average of a list of numbers

When you run it your Electron will ask you how many numbers you want to take the average of, and then, after you've typed them in, automatically produce the average.

The first two lines are just REM statements – there for information only. The Electron looks at lines 10 and 20 and ignores anything after the REMs.

These lines are just there for giving information to humans and can be left out if you want. The program will still run.

Line 30 selects Mode 6 (if you've just switched on, the micro will be in Mode 6, anyway). Line 40 switches off the text cursor, which can otherwise disrupt the display.

Lines 50 and 60 set the two variables count and total to zero. These variables are used later in the program and have to be given an initial value or things will get confused.

Try leaving them out and you'll see what I mean.

The next line uses the INPUT keyword to produce two things, a message on the TV screen, and a new variable, limit.

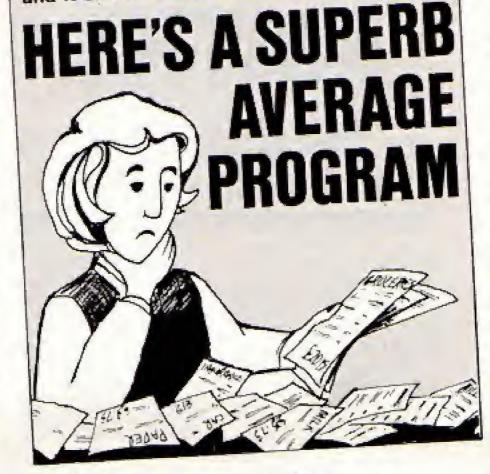
The message on the screen asks you how many numbers you want to take the average of

When you type in a number and press the Return key this number is stored in the variable limit.

All the TAB commands do is to arrange the message neatly on the screen. You can leave them out if you so desire, but the screen will look pretty jumbled.

When the Electron comes to the INPUT command of line

Suppose you want to find out just how much your average shopping bill is – but you spend different amounts each week. NIGEL PETERS has come up with a neat solution – and it can be used in lots of other ways too



70 it will display the message (nicely tabulated) on screen and then wait for a value to be given to limit.

The program comes to a stop and only starts again when you actually input a value to satisfy the INPUT command.

Given a value for *limit*, the Electron moves on to line 80 which use CLS to clear the TV screen.

And that's the preliminaries of the program over with. Now we come to the part that does all the real work.

Lines 90 and 110 set up a REPEAT . . . UNTIL loop. This "calls" the procedure PROC-input each time round the loop until count is equal to limit.

When this happens the program drops out of the loop and goes on to line 120, which calls PROCmean.

This procedure works out the average of the numbers you've typed in and prints it on the screen.

At its simplest level a procedure is just a group of program lines that can be called over and over again by name as required.

The lines that make up the procedures are tucked away at the end of the program and the Electron refers to them automatically when they're called.

As you might guess, line 130 signifies the end of the program.

But, you might ask, if 130 is the end of the program, what about all the lines that follow it?

Well these are where we tuck away the lines that define the procedures that we've called from the main program.

The END of line 130 separates them from the rest of the listing. Try leaving it out and you'll see that the program careers into the procedures after it has done all the work in lines 10 to 120.

Putting END before the procedure definitions ensures that this doesn't happen.

Lines 140 and 190 define PROCinput. The lines in between these are the main body of the procedure and do the work.

This consists of getting you to type in the next number, adding it to the running total kept in total and updating count to keep track of how many numbers you've typed in.

PROCmean, defined between lines 200 and 240, just calculates the mean average by dividing the sum of all the numbers, total, by count, the number of figures that you've typed in.

Line 220 just clears the screen, while line 230 prints out the answer.

Simple isn't it? Incidentally, there are two other means you can take, the mode and the median.

The mode is the number that appears most in a set of figures.

If you had 1,2,1,2,2,4,6,5 then the mode is 2 as it appears most often.

The median of a set of numbers is the one that comes in the middle of that set of numbers when it is ordered numerically.

If the numbers are 2,5,4,3,8 then in numeric order is 2,3,4,5,8 and the median is 4.

Can you modify the above program to calculate these values? Have fun trying. I'm told that it is statistically possible!

- 10 REM AVERAGE CALCULATOR
- 20 REM ELECTRON USER
- TO MODE &
- 40 VDU 23,1,0;0;0;0;0;
- 50 count≃0
- 60 total=0
- 70 INPUT TAB(5.5) "How many values do you want" TAB(5.7) "to take the mean of?" TAB(5.9) "Enter the number and press

Return TAB(20,13) limit

- 80 CLS
- 90 REPEAT

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

- 100 PROCinput
- 110 UNTIL count=limit
- 120 PROCeean
- 130 END
- 140 DEF PROCinput

150 [NPUT TAB(5.5)*Please enter next number* TAB(5.7)*and press Return .*TAB(20.13)number

160 PRINT TAB(0,13)STRING\$(40

- 4 1
- 170 count=count+1
- 180 total=total+number
- 190 ENDPROC
- 200 DEF PROCuean
- 210 mean=total/count
- 220 CLS
- 230 PRINT TAB(5,15) "The mean
 - is "; mean
- 240 ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 45. THIS month's Maths Workout is concerned with numeric variables and their limits. Sounds formidable, doesn't it?

Don't worry though, it's not too difficult. After all you've probably already used numeric variables.

If you've ever written a program with a line like:

100 LET count=100

then you've used a numeric variable, count. It's a variable that contains a number, therefore it's a numeric variable. Simple isn't it?

In this article we'll be covering the two types of numeric variables that the Electron can use — real and integer numeric variables — and learning about their uses and limitations.

The first type of numeric variable that we'll meet is the real variable.

Like the man who suddenly discovered that he had been speaking prose all his life, you'll be pleased to learn that you've been using real numeric variables all the time without thinking about it!

A real variable is a numeric variable that can stand for both whole numbers — technically called integers — or for numbers that have fractions in them.

Hence in the following lines:

10 count=273 20 fraction =1.34

both count and fraction are real variables.

They can both stand for numbers which are decimals or have a decimal part. It just happens that in this case count is a whole number.

A numeric variable is always a real variable unless it ends with the percentage sign. But more about this later.

From the way I've been emphasising that real variables have the ability to represent fractions, you've probably guessed that there is a type of numeric variable that can only stand for whole numbers.

This second type of numeric variable is called an *integer* variable. The value you give to this type of variable has to be a whole number.

It can't be a fraction or, rather, a decimal. The Electron does its sums in decimals, not **CHRIS BARTON'S**

MATHS

Exercises for the Electron

fractions.

An integer variable name has to end in the percentage sign "%" which you'll find on the keyboard above the number 5.

A variable name ending in % tells the Electron that that name can only represent whole numbers.

The following variables are all integer variables, as you can see from the % at the end of their names:

> win1 = 20 lose1 =30 x1=1253

You might wonder what happens if you accidentally give an integer variable, say whole%, a fractional value, say 1.21. Try it and see. Type in:

whole% = 1.21

and press the Return key.

Then use the PRINT command to find the value of whole% by entering:

PRINT whole%

As you'll see the Electron has just ignored all the decimal part. The variable whole% is now equal to 1, a whole number.

The % at the end of the variable name told the Electron to expect a whole number and that's all it accepted. It took the integer part of the value offered and ignored the rest.

Try it with a few other decimal numbers and you'll soon see how it works.

If we wanted to use a value of 1.21 then we would have to use a real variable – that is to say one that doesn't end in %.

The Electron will happily accept:

whole = 1.21

as it now has a real variable

name to store the decimal in.

The rule is that if you are dealing with whole numbers only then use integer variables. If your variables might have decimal values then stick to real variables.

As you might have noticed when typing in decimal values to integer variables the Electron doesn't tell you when it's lopped off the decimal part.

It just does it and keeps quiet about it!

If you think about it you'll see that this can be a fruitful source of errors if you've mixed up your variable names.

But why have two types of variables in the first place? There are several reasons.

The first is that integer variables take up slightly less precious memory space than real variables.

This makes sense, if you think about it, as with integer variables the Electron doesn't have to worry about finding room to store the decimal part of a number.

When memory space becomes limited, programmers tend to use integer variables if at all possible.

Also integer variables make programs run faster. The Electron can use them much more quickly than real variables.

Again, it doesn't have to bother about fractions, which saves time.

And they are accurate, provided that they stay in range, which we'll come to shortly.

Sometimes integer variables are more realistic. Who ever heard of half a cow or 0.33 of a space invader?

If you think about it, with a real variable, one that works with decimals, there's always room for error. Suppose a real variable, counts, was made equal to 1 divided by three.

counts = 1/3

If you now enter:

PRINT counts .

you'll see that counts is now equal to:

0.333333333

Now, as you know from your maths at school, one divided by three is one third in fractions but is 0.3 recurring in decimals.

This means that the answer isn't really:

0.33333333

Obviously, with numbers that recur like this, the Electron has to draw the line somewhere. It can't keep printing out the answer fo five divided by three for ever.

In fact the Electron draws the line at what is known as nine significant figures. It gives you nine accurate places and then gives up.

You'll see what this means if you look at the result of dividing one by three as we did

Variable Specifications	Real	Integer
Example names	Count, Total, limit, X	row%, num% xpos%, A%
Example values	63.78, -1.4, 0.3, 1000	200, -15, 2 , 1000
Maximum size	1.7E38	2,147,483,647
Accuracy limits	nine significant figures	absolute

Figure I: Real and integer variables

above. You get nine 3s after the decimal point and that's it.

Try dividing five by three and you'll see the same thing.

The point is that the Electron works within certain limits of accuracy. What this means is that it will work out a number to nine significant figures of accuracy.

There are ways of changing this, as we'll see in later articles, though nine places is the highest accuracy that you'll get.

In the normal course of events, you won't be too troubled by the accuracy limits of the Electron.

However, if you're writing a program that contains a lot of maths and you start getting some funny results just check that you're not overlooking the Electron's limits. We'll go onto explore these, shortly.

Before we do that, though, I must mention some rather special integer variables known as the resident integer variables.

These are the 26 integer variables A%, B%, C% and so on to Y% and Z%.

The resident integer variables work just like normal integer variables but they have one special property.

Normally, when a program is RUN, it clears all the variables that may be in memory from previous programs.

Similarly, entering NEW, pressing the Break key or, even more devastating, pressing CTRL and Break at the same time, has the same effect of clearing the old variables.

They do not, however, get rid of the resident integer variables, hence the name.

One useful result of this is that you can pass results from one program to another via these variables.

Run Program I which assigns values to the resident integer variable M% and the real variable real.

10 REM PROGRAM I 20 LET MX=233 30 LET real=12.89

Now press the Break key or enter NEW and press Return. Then run Program II:

> 10 REM PROGRAM II 20 PRINT MZ 30 PRINT real

Because it is a resident integer variable, M% still exists in memory with a value of 233 which is printed out.

However, real doesn't exist any more so Program II can't print it out. Hence the error message when the program is run.

Now, let's go on to exploring some of the limits of both types of numeric variables. How big can they be? Is there any limit to the size of either type of variable?

The answer is yes, as you'll see from Figure I. The highest value a real integer can have is 2,147,483,647 which is a lot! The highest value that a real variable can have is 1.7E38.

Now that final figure might look a little odd, but it's just the Electron's way of writing the number that starts with 17 and has 37 Os following it. And that's a big number!

This method of writing numbers is known as the exponential method and it looks more complicated than it really is.

It's just a shorthand way of writing very large numbers, and very small ones. The exponent form is a number, followed by E followed by another number such as:

2E3

This is actually the number 2000 as you can check by getting the micro to:

PRINT 2EJ

Exponent	Calculation	Value
1E2	1×10×10	100
1EO	1x1	1
1E-1	1×0.10	0.10
2.7E3	2.7×10×10×10	2700
0.8E4	0.8×10×10×10×10	8000

Figure II: Exponential forms

The figure 3 after the capital E means 10 to the power of 3. Or, if you want it another way, 10 multiplied by itself three times, which is 10 × 10 × 10.

It's easy to calculate the powers of 10. You just write down a 1 and follow that with the same number of 0s as the power. If the power is 5 you follow the 1 with 5 zeroes.

In this way you can see that E4, or ten to the power of 4, is 10000 - that is 1 with four Os after it. Similarly E6 is 1000000 and E2 is 100.

Two special cases are E1 which is 10 and E0 which is 1. Also E-1 is 0.1 (or one tenth), E-2 is 0.01 (or one hundredth) and so on.

But we were looking at the exponential number 2E3. We can work out that E3 means the number 100 but what of the 2 in front of it?

This simply stands for the number of times that 1000 (E3) should be multiplied.

So 2E3 is another way of writing 2 times 10 to the power of 3, which is just another way of writing 2 x 10 x 10 x 10 which is 2000.

Normally the Electron won't bother with the exponent form for small numbers as it's as easy to write 230 as it is to write 2.3E2.

It's only in the higher ranges that the exponential form is a handy shorthand method of writing large numbers. The Electron automatically swops over to this form when necessary.

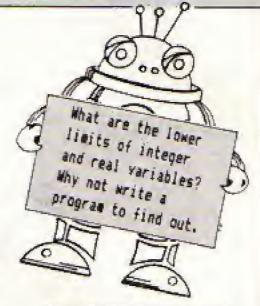
If you're still not too sure about exponentials, take a look at Figure II which shows some numbers in both normal and exponential form.

But let's return to our explorations of the Electron's numerical limits.

Run Program III and see what happens. Is there anything wrong with the result.

10 REM PROGRAM 111 20 LET XX=999999999 30 LET XX=XX+2 40 PRINTXX

What the program is meant to do is multiply 999999999 by 2. If you do it on paper you'll see that the answer is 199999998. Yet your Electron tells you that the answer is 2E9 which, as you know, is 20000000000. The Electron's answer is out by 2.



This is because we've gone beyond the magic nine significant figures of accuracy. And this is with integer variables which are the most accurate type of numeric variables!

Having said that, an error of 2 in 2000000000 isn't all that much.

Let's further explore the limits of integer variables with Program IV:

1	O REM	PROGRA	W IV
20	D LET	11=100)Ø
31	O REP	EAT	
5	0 17:	=11+10	
.bi	O PRI	XX TV	
7	O UNT	IL FALS	E

This sets an integer variable, X%, to 1000 and then multiplies it by 10 each time round the REPEAT . . . UNTIL loop.

When you run the program you'll see the following appear on the screen:

10000
100000
1000000
10000000
1000000001
169
Top big at line 50

As you can see, the program quite happily prints out the value of X%, going into the exponential form when it reaches ten figures.

Eventually the program grinds to a halt with the "Too big" error message when X% exceeds the maximum value of an integer variable, which you'll see in Figure I.

Let's see what happens when we take a real variable, X, to its limits in Program V.

You'll notice that this is practically the same as Program IV, only the integer variable, X%, has become the

From Page 41

real variable, X.

10 REM PROSRAM V 20 LET X=1000 30 REPEAT 50 LET X=X+10 60 PRINT X 70 UNTIL FALSE

Again this prints out the increasing values of the variable until it reaches the maximum limit for a real increase X beyond this we get the "Too big" error message:

10000	
100000	
1000000	
10000000	
100000000	
1E9	
1E10	
1E11	
1E12	
1E13	
1E14	
1E15	
1EI&	
1E17	
1E18	
1E19	
- 1E20	
1E21	
1E22	
1E23	
1E24	
1E25	
1E26	
1E27	
1E28	
1E29	
9.9999999629	
9.9999999E30	
1E32	
1E33	
1E34	
1E35	
9.9999999535	
1E37	
1£38	
Too big at line 50	

One point of interest is that where you might expect 1E30, 1E31, and 1E36 we get some very strange figures.

If you try working these out on paper you'll see that they are almost the right answers, but not quite. Again the limits of accuracy raise their ugly

Try running Program VI which sets the Integer variable, X%, to the maximum amount an integer is allowed

> to REM PROGRAM VI 20 LET XX=2147483647 30 FOR repeat=1 TO 10 40 LET XX=XX+1 50 PRINT XX 60 NEXT repeat

The FOR ... NEXT loop tries variable, 1E38. When we try to to add 1 to this each time. Yet take a look at the results:

> -2.14748365E9 -2.14748365E9 -2.14748365E9 -2.14748364E9 -2.14748364E9 -2.14748364E9 -2.1474836489 -2.14748364E9 -2.14748364E9 -2.14748364E9

As you can see, when you go over the maximum limit, you get some very funny numbers

Program VII tries to do the same thing with a real variable. It sets X to its maximum value and then tries. to add 1 to it each time round the loop:

10 REM PROGRAM VII 20 LET X=1.7E38 30 FOR repeat=1 TO 10 40 LET X=X+1 50 PRINT X 60 NEXT repeat

The result is:

1.7E38	
1.7E38	

As you can see, the value of X remains obstinately the same, refusing to increase beyond its maximum limit.

And that's about it for this month. Try running the programs and messing around with them. You'll soon become a minor expert on numeric variables and their limits. And you'll have fun learning.

EVERYTHING TO DO WITH electron

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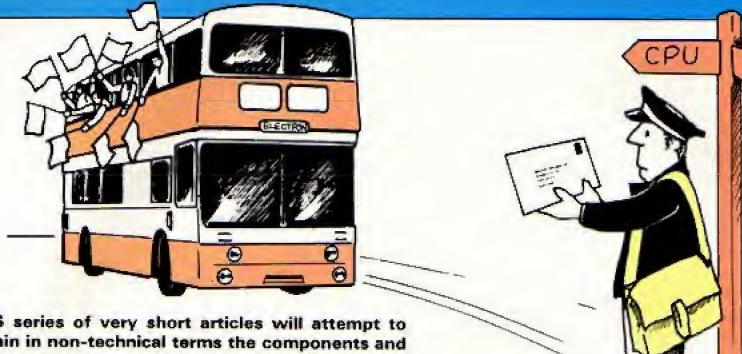
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THIS series of very short articles will attempt to explain in non-technical terms the components and processes that go to make up your Electron. By following them month by month, little by little you will eventually arrive at the stage where you will be able to understand what is going on under the plastic lid of your computer.

Let's start with an address. location. What does that mean?

An address is the identification of a location. In postal terms it is where someone lives. In computer terms it is where a number is to be found.

Numbers have very many different meanings, as we shall see later.

The address is specified inside the computer by 16 wires. These are known collectively as the address bus. Each wire can be in one of two states, as indicated by the voltage on the wire.

The two states are known as logic one and logic zero. A high voltage is logic one, a low voltage is logic zero.

You can think of each wire as being like a man holding a flag - the flag can be either up or down.

If there were only one man (or wire) making up the address bus then there would be two possible addresses flag down or flag up.

Or, in computer terms. address location O and address location 1,

If the solitary man were

joined by another the number of combinations of raised and lowered flags would be doubled.

This is true for each additional man as the most

expressed in mathematical terms by saying "two raised to the power 16" (the number of wires).

This can be written 216. It just means that two is

number is stored. Therefore an address location is sometimes. called a memory location because the number is usually stored in some kind of memory.

The number itself is effectively made up of eight flags. which means that it can consist of one of 256 possible combinations.

Each flag has its own wire. The collection of the eight wires is known as the data bus and is common to all 64k of memory locations.

Each memory location reports its contents over the same wires. So only one address location can be read (or looked at) at any instant.

Each individual flag in a memory location is known as a bit and the eight bits together are called a byte.

Incidentally, four bits (or half a byte) are known as a nibble (can't you just tell it's American technology?)

The major part of your Electron is a vast number of address locations - just like a housing estate - with each location containing something different.

In fact everything connected to the computer - memory, cassette recorder, sound channel or TV circuit - has to have its own unique address.

A plan of what address is assigned to what device is called a memory map. You can find one in the Electron User Guide.

The various devices the computer uses to store its numbers in will be looked at in next month's issue of Electron User.

WHAT'S THAT WHEN IT'S AT HOME

MIKE COOK explains the inner workings of the Electron

recently arrived man, could first have his flag down for all the previous combinations and then have it high for all the previous combinations.

So for each additional man/wire we can double the number of combinations. (See Table 1.)

As the number of address locations doubles it soon gets very large.

This doubling can be

multiplied by itself 16 times (2) \times 2 \times 2 \times etc). As these numbers get very big we tend to use a shorthand.

> We say that two to the power 10 is 1k of address locations (k stands for kilo meaning a thousand). You can see from the table

way of expressing them.

that 1k is not exactly 1,000 but 1.024. It's a sort of "Baker's Dozen" version of a thousand

So we say that an address bus with 16 wires can address. 64k address locations (64 x 1024 = 65,536).

This is the maximum number of different address locations the Electron can cope with. In fact it is the maximum for most home computers.

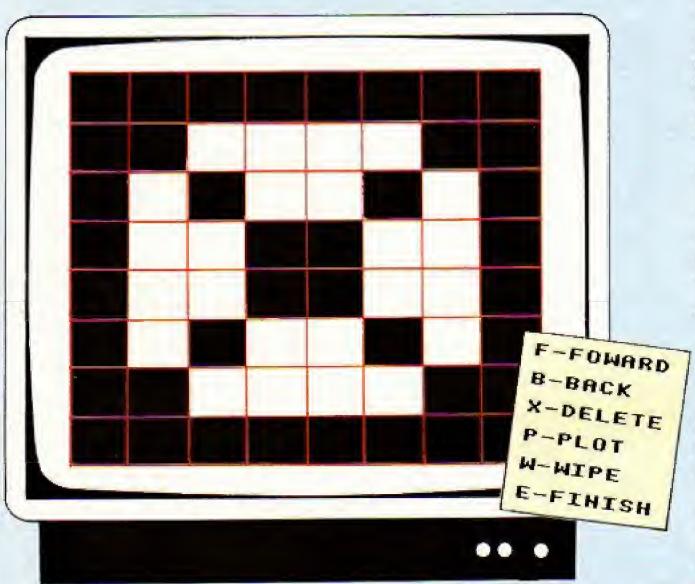
There are tricks you can play to make the computer appear to handle more address. locations but nothing can really extend this number.

At each address location a

Number of wires	Number of addresses
1	2
2	4 2 x 2
3	8 2 × 2 × 2
2 3 4	16 2 x 2 x 2 x 2
5	32 etć.
:	
8	256
10	1,024
1	
16	65,536

Teble I

Character generating without tears By NICHOLAS TIMBERLAKE



HAVE you ever wanted to

create some shapes for Casting Agency but been put off by the maths involved? Never fear, Electron User comes to your aid with this-easy-to use Character Generator.

Using your Electron's keyboard you can draw the character you want directly on the TV screen.

When you are satisfied with it the Electron will do the sums for you and tell you all the figures that make up that character and show you what it looks like.

It will even remember previous characters that you've typed in.

All the instructions are in the program. Type it in, run it and creating new shapes for Casting Agency will be easy. The only limit is your imagination.

Why not send your new shapes to our Casting Agency? After all, now we've made it simple - it's all at the touch of a finger.

10 REM ************** +444 20 REM + + 30 REM + CHARACTER GENERAT 40 REM . FOR THE ELECTRON 50 REM + * 60 REM + BY N. TIMBERLAKE 70 REM + + 75 REM + (C) ELECTRON 80 REM **************

90 VDU 23.255.60,66;153 .161,161,153,66,60 100 DIM N(8) :DIM T2 (50) 110 MODE 6

++++

:CLS :PRINT TAB(11.10) CHR\$ 131"Instructions(Y /N) ":

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

:6\$=BET\$: IF 6\$()"Y" AND 6\$() ·N. THEN GOTO 110 120 IF G\$="Y" THEN HODE 1 : PROCINSTRUCTIONS 130 MODE 1 140 VDU 28.0.31.39.0 : CLS 150 PRINT TAB(2,1) "-----160 SCOL 0.1 : PROCSCREENPLOT

170 CLS

: PRINT :PRINT "OPTION: ": : G\$=GET\$ 180 DJ=0 190 IF 65="V" THEN PROCCHARVIEW 200 IF G#= 0' THEN GCOL 0.1 :CLS :CLS :PROCSCREENPLOT : PROCORAN 210 IF INKEY (-55) THEN CLS : PRINT "WHICH ONE":

: EMPUT CH :CLS :PRINT :CH:" ": CHRS CH : H\$= [NKEY\$ (300) 220 6010 170 230 DEF PROCCHARVIEN 240 FOR A=225 TO 255 250 PRINT TAB(31); A: "; CHR\$ A: 260 SOUND 1.-15,80.1 270 G\$=[NKEY\$ (10) : IF 64="H" THEN 6\$=6ET\$ 280 IF 6\$="S" THEN ENDPROC 290 NEXT 300 6010 170 310 DEF PROCORAN 320 11=155 : YX=845

Turn to Page 46

Make light work of listings!

All program listings in Electron User have been put on tape - to save you the chore of keying them in yourself. Three tapes are now available - one for March, one for February, and an introductory tape of all the programs from the first few introductory issues.

On the March tape:

CHICKEN Let dangerous drivers test your nerve. COFFEE A tantalising word game from Down Under. PARKY'S PERIL Parky's lost in an invisible maze. REACTION TIMER How fast are you? BRAINTEASER A puzzling program. COUNTER Mental arithemetic can be fun! PAPER, SCISSORS, STONE Out-guess your Electron. CHARACTER GENERATOR Create shapes with this utility. FUNNY POLYGONS Fast graphics going round in circles. RABBITS Easter bunnies all over! DRAW Multi-coloured lines. MEAN Just an average program,

On the February tape:

NUMBER BALANCE Test your powers of mental arithmetic. CALCULATOR Make your Electron a calculator. DOILIES Multi-coloured patterns galore. TOWERS OF HANOI The age old puzzle. LUNAR LANDER Test your skill as an astronaut. POSITRON INVADERS A version of the old arcade favourite. MOON RESCUE Avoid the asteroids and save the spacemen. STARS A program making pretty pictures. TAPESTRY Symmetry and colour combine.

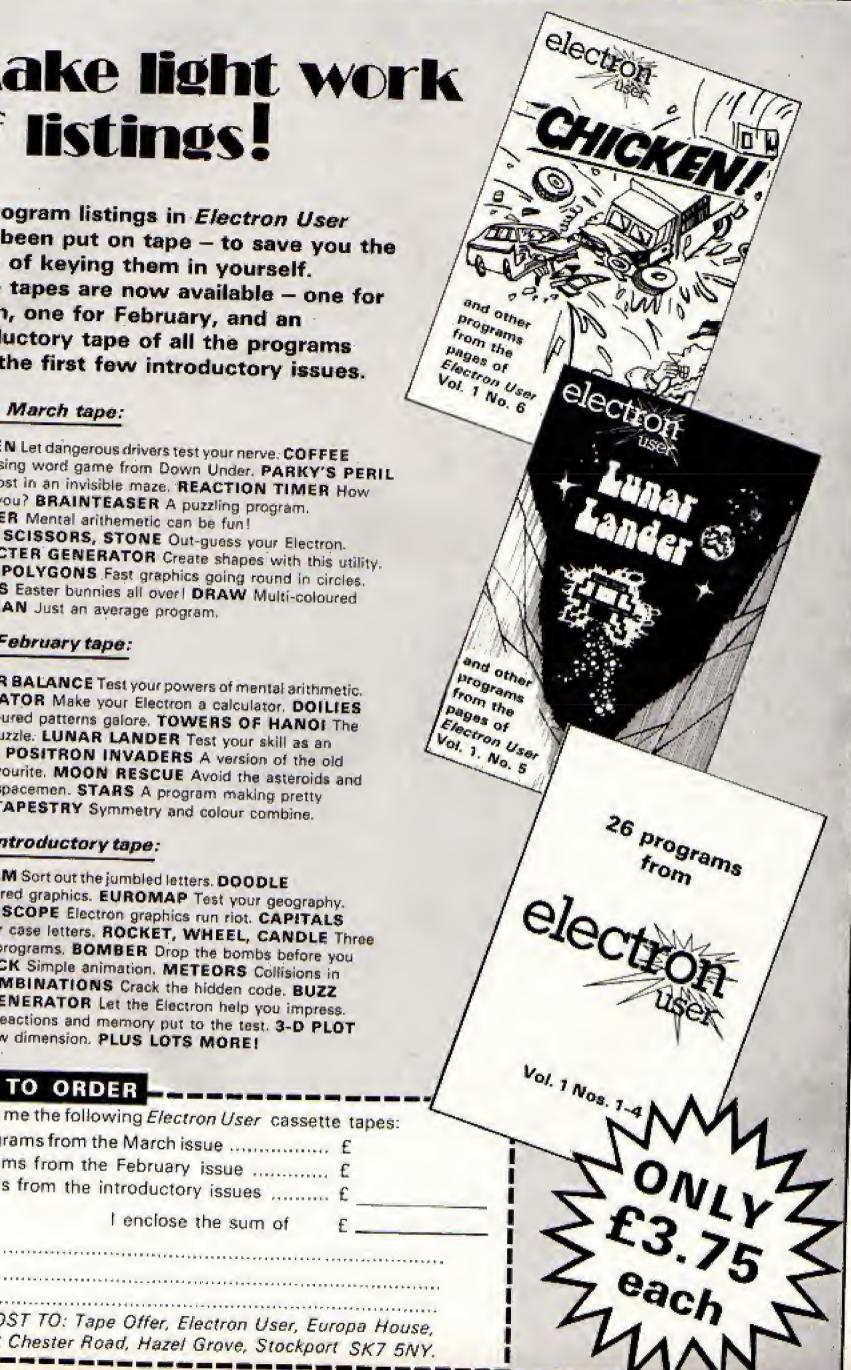
On the introductory tape:

ANAGRAM Sort out the jumbled letters. DOODLE Multicoloured graphics. EUROMAP Test your geography. KALEIDOSCOPE Electron graphics run riot. CAPITALS New upper case letters. ROCKET, WHEEL, CANDLE Three fireworks programs. BOMBER Drop the bombs before you crash. DUCK Simple animation. METEORS Collisions in space. COMBINATIONS Crack the hidden code. BUZZ WORD GENERATOR Let the Electron help you impress. SIMON Reactions and memory put to the test. 3-D PLOT Enter a new dimension. PLUS LOTS MORE!

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> POST TO: Tape Offer, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.



Character Generator listing

From Page 44	*0*	:K=.5	930 PRINT TAB(2,15)*To
10000	THEN YX=75	:L=0	leave the program
330 PRINT TAB(0.2) F-FONARD	: X=925	710 L=L+1	press 'BREAK'*
	500 IF YN\$="Y"	:1F L>8	940 PRINT TAB(4,28)*Press
340 PRINT TAB(0,4) "B-BACK"	THEN GCGL 0.0	THEN GOTO 820	any key to continue";
350 PRINT TAB(0.6) "X-DELETE	:0J=2	720 FOR F=1 TO 8	:G\$=GET\$
	: PROCSCREENPLOT	730 K=K+K	950 CLS
360 PRINT TAB(0.8) "P-PLOT"	: PROCVDU	740 IF POINT (XX, YX)=3	:COLOUR 1
370 PRINT TAB(0,10) "M-MIPE"	510 IF QJ=2	THEN N(F)=K	:PRINT TAB(0.3)"IF
380 PRINT TAB(0,12) "E-FINIS	THEN GCGL 0.1	ELSE N(F)=0	you pressed'V'-"
H*	:6010 140	750 XX=XX-110	960 COLOUR 2
390 IF YX)900	520 PRINT TAB(0.20)*	760 NEXT F	:PRINT TAB(18.3) "Charac
THEN Y1=845		770 YX=YX-110	ters will appear*
400 YN\$="Q"	530 6010 390	: XX=970	TAB(19,4)*on the screen
410 6CDL 0.3	540 DEF PROCSCREENPLOT	780 TX(L)=N(1)+N(2)+N(3)+N(next to TAB(19.5)
:PLOT 69,XZ,YZ	550 RESTORE	4)+N(5)+N(6)+N(7)+N(8)	"their appropriate"
420 G\$=GET\$	560 READ TUZ.XTZ,YTZ	790 PRINT TAB(31); T1(L):	TAB(19.5) "numbers.To
430 IF 6\$="W"	570 IF TUX=1	800 K=0.5	make the TAB(19.6)
THEN CLG	THEN MOVE XTX.YTZ	810 GOTO 710	"listing pause press"
:6COL 0.1	590 IF TUX=0	820 VDU 23.CHR.TX(1).TZ(2)	TAB(19,7) "CTRL and
:PROCSCREENPLOT	THEN DRAW XTX, YTZ	(12(3),12(4),12(5)	SHIFT.
: PROCORAW	590 IF TUX=50	, TX(6), TX(7), TX(8)	970 COLOUR 1
440 IF 63="P"	THEN 60TO 630	830 VDU 28.0,31,39.0	:PRINT TA8(0,9)*If
THEN DRAW XX+55.YX+55	600 6DFD 560	:CLS	you pressed 0'-"
:DRAW XX-55.YX-55	610 DATA 1.100,20,0,980	:CLG	980 COLOUR 2
:PLOT 85.XX-55.YX+55	,20,0,980,900,0,100	:PRINT TAB(20,15);	:PRINT TAB(18,9)*Charac
DRAW XX+55.YX+55	,900,0,100,20,1,100	CHR\$ CHR	ter number will"
: DRAW XX-55, YX-55	,130,0,980,130,1,980	:PRINT TAB(3,5) "VDU":23	TAB(19,10) appear on
:PLOT 85. XX+55. YX-55	,240,0,100,240,1,100	;",";CHR;",";TX(1);	the screen. "TABILY
450 IF 6\$="F"	,350,0,980,350.1.980	*,";TX(2);*,";TX(3);	,111 To this you enter
THEN GCOL 0.0	.460,0,100,460,1,100	",":T1(4):",":T1(5):	the TAB(19,12) number
:PLOT 69.XX.YX	,570.0,980,570.1,980	*.": TX(6); *. "TX(7):	of the TAB(19.13)
:XX=XX+110	,680,0,100,680,1,100	",";TX(8);"	"character required."
:IF XX)980	,790,0,980,790,1,980	:PRINT TAB(7,25)*Press	990 COLOUR I
THEN XX=155	,900,0,100,900	any key to continue":	:PRINT TAB(0,15)*1f
177=77-110	620 DATA 1,210,20,0,210	:6\$=8ET\$	you pressed D'-*
460 IF 6\$=*B*	,900,1,320,900,0,320	840 ENDPROC	1000 COLOUR 2
THEN GCOL 0.0	,20,1,430,20,0,430	850 DEF PROCINSTRUCTIONS	:PRINT TAB(18,15) A
:PLOT 69.12.12	,900.1.540,900.0.540	860 CLS	grid will appear on"
: 11=11-110	,20,1,650,20,0,650	870 COLOUR 1	TAB(19,16) the screen
: IF X1(155	,900,1,760,900,0,760	PRINT TAB(10,2)*CHARAC	with a"TAB(19,17)
THEN 11=925 171=71+110	,20,1,870,20,0,870	TER DEFINER"	"dot in the top right"
470 IF G\$="X"	,900,50,0,0	:PRINT TAB(10,3) "=====	TAB(19,18) hand corner
THEN GCOL 0.0	530 VDU 28,31,30,39,0	880 COLOUR 3	of the TAB(19,19)
	640 ENDPROC	:PRINT TAB(0.5)*Firstly	"grid. This is your" TAB(17,20) "cursor.";
:DRAW 12+55.Y2+55	650 DEF PROCVOU	the state of the s	1010 PRINT "All other"
: DRAW XX-55, YX-55	660 CLS	the computer will orint-OPTION-, you	TAB(19.21)*instructions
:PLOT 85, XX-55, YX+55	670 PRINT "CHARACTER NUMBER	can answer this in	are TAB(19,22) explain
: DRAW XX+55, YX+55	(225-255)*;	a number of ways depen	ed later in TABil9
DRAW XX-55, YX-SS	: INPUT CHR	ding on what you want	,23) the program.
:PLOT 85, XX+55, YX-55	680 IF CHR)255 THEN CLS		1020 PRINT TAB(4,29)*Press
:GCOL 0.1 :PROCSCREENPLOT	:PRINT "TOO BIG"	to do." 890 COLOUR 2	any key to continue":
480 IF 6\$="E" OR YX(40	:60TO 670	900 PRINT TAB(2,9)*To list	:64=GET\$
100 (F 07- E UN 14/40	690 IF CHR(225	characters 'V'"	:ENDPROC
THEN PRINT TAB(0,20)	THEN CLS	910 PRINT TAB(2,11)*To	
PRESS Y IF YOU	:PRINT "TOO SMALL"	list just one characte	This listing is included in
HAVE FINISHED":	:60TO 670	L O	this month's cassette
:YNS=GETS	700 XX=970	920 PRINT TAB(2,13)*To	tape offer. See order
ADA 1E VBEZNIVIAND VBEZN	. YY=800	draw a character 'D'?	form on Page 45.

form on Page 45.

draw a character 'D'

490 IF YMSO "Y"AND YMSO

:Y1=890

FILL your TV screen with Easter Bunnies with this simple program from Mike Rowe. He sent the rabbits in for Casting Agency, but his listing is so good that we decided to run it as a feature in its own right.

What next? Will readers send in programs with sheep leaping over gates? This would be a boon for insomniacs.

Will we have a fox and hounds hurtling across the screen? Low flying Electron pigs? We can't wait!

THIS program is quite simple to type in and easy to understand. Line 90 puts the Electron into Mode 2. If you want to see what the rabbits look like in other modes then just alter this line.

Line 100 fixes the number of rabbits at two, and the next line sets the Electron's internal stopwatch to zero.

The main work of the program is done in PROC rabbits, which you'll find between lines 290 and 460.

You'll recognise the VDU23s from Casting Agency and, as you might guess, these lines define the bunnies.

Lines 380 and 390 use the RND and COLOUR keywords to change the bunnies' colour at random.

The RND command is used again in line 400 to decide where the rabbits are to be printed, and the remaining lines put the bunnies on the screen.

You'll see from the listing that PROCrabbit appears twice.

The first time is in line 140 when it prints two rabbits. Line 150 causes the Electron to pause for half a second (you'll see that this line is used to create two more pauses).

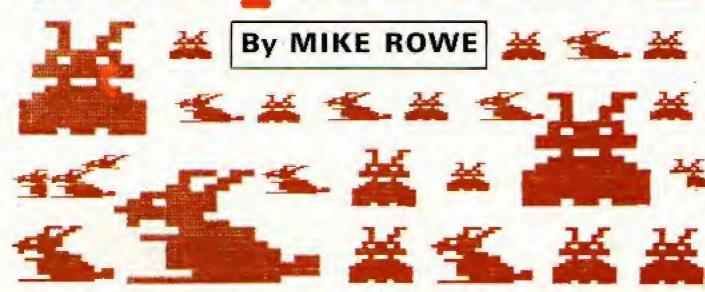
Line 230 calls PROCrabbit again and, since it is in the FOR ... NEXT loop formed by lines 200 and 240, it fills the screen with bunnies. Incidentally, VDU7 just makes the Electron beep.

PROCend, which is called in line 260, is defined between lines 480 and 520. All it does is to clear the screen of rabbits (line 490) and print the final

And that's all there is to it. Anyone for a jumping sheep program?

You've read the book, you've seen the film - maybe even eaten the pie - but now you can have . . .

mputerised!



10 REM #In answer to

20 REM this program draws rabbits breeding

60 REM The rabbits are

70

80

100 rabbits=2

110 TIME =0

120 PRINT " " WE START OFF WITH 2 RASBITS"

130 VDU 7

140 PROCrabbits

150 REPEAT UNTIL TIME =50

160 CLS

200 FOR rabbits = 2

210 TIME =0

220 VDU 7

230 PROCrabbits

240 NEXT rabbits

request for "Shapes"

all over the screen

30 REM from .. NIKE ROWE

40 REM (C) ELECTRON USER

50 REM

drawn in PROCrabbits

90 MODE 2

180 PRINT "" "THEN...."

190 TIME =0

:REPEAT UNTIL TIME =50

10 100

:REPEAT UNTIL TIME =50

250

260 PROCend

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on

270

280 END

290 DEF PROCrabbits

300 VDU 23,240,7,4,13

,63,111,255,126,79

310 VDU 23,241,96,192

,128,0,0,0,0,128

320 VBU 23,242,7,63,15

.15, 15, 15, 3, 127

330 VDU 23,243,224,224

,240,248,251,255,255

,248

340 VDU 23,244,6,2,2,2

.7.5.15.15

350 VDU 23,245,48,32,96 ,64,224,160,240,240

360 VDU 23,246,2,7,15

,31,31,31,31,29

370 VDU 23,247,64,224

,240,248,248,248,248

, 184

380 J=RND(14)-1

390 COLOUR J

400 X=RND(18)

Page 4 of the February issue.

: Y=RND (30)

410 PRINT TAB(X,Y)CHR\$ (240

); CHR\$ (241)

420 PRINT TAB(X,Y+1)

CHR\$ (242); CHR\$ (243)

430 PRINT TAB(X+2,Y)

CHR\$ (244):CHR\$ (245)

440 PRINT TAB(X+2, Y+1)

CHR\$ (246); CHR\$ (247)

460 ENDPROC

470

480 DEF PROCend

490 CLS

500 COLOUR 3

: COLOUR 130

510 PRINT TAB(0,10)"

The TY is clogged

up with rabbits "

520 ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 45.

POOR little Parky has got himself lost, and the only way home is through a maze. The trouble is that the walls of the maze are invisible. This means that Parky has to travel through it one step at a time, marking out the route as he

Your job is to guide the poor little fellow through the labyrinth using your Electron's keyboard. If and when you're successful your micro will tell you how long you took and offer you another go.

It's fun to play and compulsive as well.

PROCEDURES

PROCmove

As you might guess this is the procedure that moves Parky (VDU 224) around the screen.

This sets up the screen, reading the DATA statements and drawing the maze.

PROCinstruct

This tells the Electron to display the instructions on the TV screen.

PROCinit

As is implied in the name this procedure "initialises" the variables, setting them to their original values. It also defines Parky and sets up the ENVELOPE that controls the sound produced when he moves-



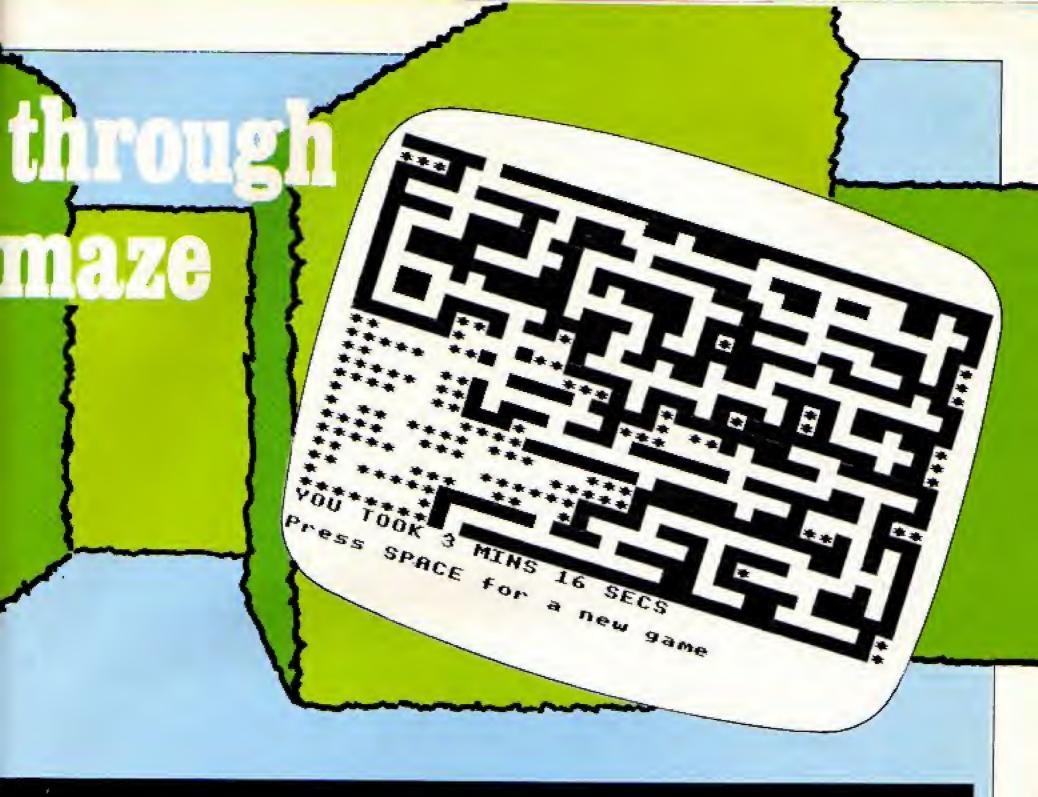
Parky listing

- 10 MODE 1
- 20 VDU 23.0,8202;0;0;0;
- 30 REPEAT
- 40 CLS
 - :COLOUR 2
 - :VDU 19,1,4;0;
- 50 PROCinstruct
- 60 PROCinit
- 70 PROCecreen
- 80 TIME =0
- 90 REPEAT
- 100 IF INKEY (-104) AND
 - POINT(IX+48,YX-16)=0XX=XX
 - ISOUND 1,1,40,1
- 110 IF INKEY (-103) AND
- POINT(XX-16, YX-16)=0XX=XX
 - -32
- :SOUND 1,1,50,1
- 120 IF INKEY (-98) AND
 - POINT (XX+16, YX-48)=0YX=YZ
 - -32
 - :SOUND 1.1.80.1
- 130 IF INKEY (-66) AND POINT (XX+16, YX+16) = 0YX=YX
 - +32

- This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.
- :SOUND 1.1.90.1
- 140 IF XX)=1120XX=32
- 150 IF POINT (XX+48, YX-16)=3
 - MOVE XX+32, YX
 - : VDU 225
- 160 IF POINT(XZ-16.YZ-16)=3
 - MOVE XX-32, YX
 - :VOU 225
- 170 IF POINT(XZ+16, YX-48)=3
 - MOVE XX, YX-32
 - : VOU 225
- 180 IF POINT(XX+16, YX+16)=3 HOVE II, YX+32
 - : VDU 225
- 190 IF POINT(XX-16, YX+16)=3
 - MOVE XX-32, YX+32
 - : VDU 225

- - 200 IF POINT(11-16, Y1-48)=3
 - MOVE XX-32, YX-32
 - : VDU 225
 - 210 IF POINT(XZ+48, YX+16)=3
 - MOVE XX+32. YX+32
 - : VDU 225
 - 220 IF POINT(XX+48, YX-48)=3
 - HOVE XX+32, YX-32
 - : VDU 225
 - 230 PROCeove
 - 240 UNTIL YX=128
 - 250 VDU 4.20
 - 260 COLOUR 2
 - 270 *FX15,1
 - 275 SOUND 1,1,200,50
 - 280 PRINT "YOU TOOK ": (
 - TIME DIV 6000) HOD 60;

- " MINS "; (TIME DIV 100) MOD 60; " SECS"
- 290 PRINT "Press SPACE for
 - a new game"
- 300 A=6ET
 - : IF A()32
 - THEN 300
- 310 UNTIL 0
- 320 DEF PROCeove
- 330 MOVE X2.YX
 - :VDU 224
- 340 MOVE AT.BY
- 2 VDU 224
- 350 AI=XX
 - :01=A1
- 360 ENDPROC
- 370 DEF PROCecreen
- 380 VOU 4
 - :CLS
 - :PRINT
- 390 RESTORE
- 400 COLOUR 3
 - :VDU 19.3.0;0;
- 410 FOR NX=010 25 :READ AS
 - :PRINT AS



: NEXT 485 ENDPROC 590 DATA ** f ###### 420 GCOL 3,1 490 DEF PROCInit **** 720 DATA ** ********* : VDU 5 500 XX=32 600 DATA "# #### ***** ****** * ** 430 ENDPROC : Y%=992 730 DATA "+ ++ ++++ 440 DEF PROCinstruct :B1=-32 610 DATA "# ######## ************ 450 PRINT TAB(15.0) "Parky's :AX=-32 ** ****** ***** *** Peril" 510 VDU 23,224,24,60,90 620 DATA "+ 740 DATA ***** *** 460 PRINT ""Poor little ,255,219,66,126,36 -Parky has gone and 520 VDU 23,225,255,255,255 630 DATA "+ ++ **** 750 DATA "**** got "''*lost (ahh). , 255, 255, 255, 255, 255 **** ** **** ****** Your job is to get him" 525 ENVELOPE 1,1,20,-20 640 DATA "# ## #### ##### "through the maze in ,20,200,200,200,127 11 11 as little time as" " ,127,127,127,127,127 650 DATA "# "possible. To start with 770 DATA *** ********* all of the maze" "is 530 ENDPROC 660 DATA "++++++ ******* hidden, but more will 540 DATA ***** *********** 780 DATA *+ *** ******** *** appear as you" "travel ** ** 670 DATA *** +++ **** further." 550 DATA "#### 790 DATA "+*++*+** ******** ******** ****** 470 PRINT TAB(15,18)"A = ** **** ** *** 580 DATA "#+++ *********** **** UP"TAB(15,20)"I = 560 DATA "**** **** *** ***** *** **** DOWN'TAB(15,22)"(### ## ## +" = LEFT*TAB(15,24)*) . 690 DATA *** *** This listing is included in = RIGHT" 570 DATA ** + ++++ **** ** **** this month's cassette 480 PRINT TAB(10,29) *PRESS ****** ** ++" 700 DATA "***** *** *** *** tape offer. See order SPACE TO PLAY" 580 DATA "**** **** ** ****** ****** +*** form on Page 45. : REPEAT UNTIL 32=GET *+* 744444 43⁶ 710 DATA ***** *****

Make up your mind with your micro HAVE you ever had dif-

ficulty making up your mind? Does having to make a decision cripple you with anxiety?

Never fear, Electron User is here with our state-of-the-art Decision Maker.

Let the micro take the decisions that you can't and won't take for yourself. Just ask the question, run the program and the Electron supplies the answer.

And if you don't like it you can just press a key and see if it comes up with an answer you do like!

The program is quite simple.

Lines 50 to 100 just print the answers on the screen. If you want a different selection of answers all you have to do is to replace the ones in the inverted commas in these lines.

Lines 110 to 130 select the colours to be used.

Line 140 switches off that annoying flashing CUISOT.

Lines 170 to 270 form a

...

acorn

electron

By PETE BIBBY

FOR ... NEXT loop which moves the square "pointer" up and down the screen 20 times.

Line 230 makes a sound each time the pointer moves.

Lines 295 and 300 provide the "decided" sound.

The variables ypos, newpos keep track of the pointer's position up and down the screen.



DON'T EVEN ASK..... PUT IT OFF.... ASK ME ANOTHER TIME.... This listing was produced using a special formatter which breaks one program line over several lines. of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

- 10 REM DECISION MAKER
- 20 REM (C) ELECTRON USER
- 30 REPEAT
- 40 MODE 1
- SO PRINT TAB(5.3) "DON'T EVEN ASK.......
- AG PRINT TAB(5.8) "NO.....
- 70 PRINT TABIS, (3) "MAYBE.
- BO PRINT TAB(5,18) "PUT
- IT OFF....." 90 PRINT TAB(5,23) "ASK
- ME ANOTHER TIME...." 100 PRINT TAB(5,28) "YES...
- 110 VOU 19,0.4.0.0.0
- 120 VDU 19.3,3.0.0,0
- 130 VDU 19.2.12.0.0.0
- 140 VDU 23.1.0:0:0:0
- 150 COLOUR 129
- 160 voos=6+RND(5)-2
- 170 FOR X= 1 TO 20
- 180 newpos=5+RND(6)-2
- 190 IF newpos=ypos THEN GOTO 180
- 200 voos=nemaos
- 210 COLOUR 129
- 220 PRINT TAB(28, yous) CHR\$ (32)
- 230 SOUND &11.-15.50+X+10
- 240 FOR delay=1 TO 250 : NEXT delay
- 250 COLOUR 128
- 260 PRINT TAB(28. vpos! CHR\$ (32)-
- 270 NEXT X
- 280 COLOUR 130
- 290 PRINT TAB(28, ypos)
 - CHR\$ (32)
- 295 ENVELOPE 2,2,6,0,0 ,255,0,0,126,0,0,-126
 - ,126,126
- 300 SOUND & 1.2.4.50
- 310 WAITS=GETS
- 320 UNTIL FALSE

This listing is included in this month's cassette tape offer. See order form on Page 45.

Ready, steady, GO!

FIND out how fast you are with our Electron reaction timer. Are you quicker off the mark than your friends? Does your reaction time vary as the day goes on? Kids, are you faster than your parents? Type in this

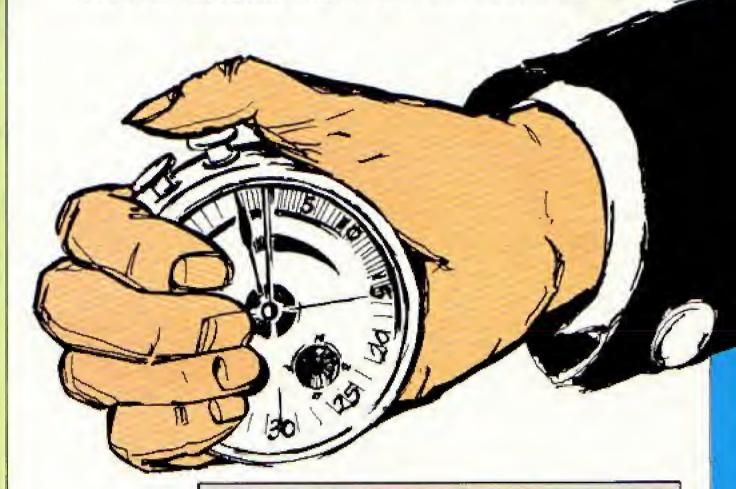
When you run the program a white bar will appear on the left of the screen. Watch it carefully because soon it's going to change colour, beeping every time to give you a warning.

listing and find out.

At first it becomes red. Then, like a set of traffic lights. it will change to yellow. This tells you to be prepared because green is the next colour and you're going to have to react quickly.

As soon as it turns to green (but not before!) you have to press the space bar. The Electron will then tell you how fast your reactions are and what it thinks of them.

Test your reactions with PETE DAVIDSON's program



PROCEDURES

PROCINIT

This procedure prints out the instructions. defines the characters and initialises the variables. It also initialises the messages in an array. M\$. These can be altered by changing the DATA in line 610, but don't make them

PROCWAIT

Calls PROCCOLOUR after working out different parameters. This causes a random wait before the bar changes colour.

PROCTEST

Calls PROCTOOSOON if you press the space bar too quickly. Otherwise it records the time you take to press the space bar in the integer

PROCCOLOUR

Changes the colour of the bar after a random

PROCTOOSOON

Gives a message if you press the space bar too soon. Don't we all!

PROCMESSAGE

Prints out a message (surprise, surprise). What the message is depends on how long it takes you to react. The time (T%) has 1 subtracted from it because it takes approximately a hundredth of a second for the program to reach this instruction.

The message given is chosen from the data in line 610. The number of the message is calculated by dividing T% by 10.

Reaction Timer listing

IA DEM JET ELECTRON HEED

10 REM (C) ELECTRON USER	1/0 PRINT The left of the
20 REM BY PETE DAVIDSON	screen will change"
30 MODE 4	180 PRINT 'colour. It will
:DIM H\$(7)	follow the sequence
: PROCINIT	of."
40 PROCWAIT	190 PRINT "traffic lights
50 PROCTEST	(red, yellow, green)."
60 PROCNESSAGE	200 PRINT "Each time the
70 *FX15,1	colour changes, you
80 A=GET	will*
- :RUN	210 PRINT "hear a beep."
90 END	220 PRINT *
100 DEF PROCINIT	
110 CLS	*1
:PRINT " REACTION	230 PRINT '* Press the
TESTER"	space bar as soon as
120 PRINT "	the"
•	240 PRINT *colour changes
130 PRINT '* Use this	to green (at the third*
program to test your"	250 PRINT "beep)."
140 PRINT "reactions."	260 PRINT *
150 PRINT "	
*;	*1
160 PRINT '" The white	270 PRINT '* Your time
bar which will appear	
an*	

ITA DOINT Witho laft of the

Reaction Timer listing

From Page 51

and rating will then

280 PRINT "given.

290 PRINT. "

300 PRINT Press any key to start the test!";

310 #FX15.1

320 A=GET

:CLS

330 VDU 20,23,255,255,255 ,255,255,255,255,255

340 A\$=CHR\$ 255+CHR\$ 255+

CHR\$ 255

:B\$=CHR\$ 32+CHR\$ 32+

CHR# 32

350 FOR 11=1TO 30

:PRINT TAB(8) A\$

: MEXT

360 FOR 1=0TO 7

:READ M\$(I)

INELT

370 II=0

: I=RND (-TIME)

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

380 *FX15,1

390 ENDPROC

400 DEF PROCHAIT

410 NZ=1

:PROCCOLOUR

: NI=3

:PROCCOLOUR

: #FX15, 1

420 NI=2

: PROCCOLOUR

430 ENDPROC

440 DEF PROCTEST

450 IF INKEY (0)()-1

THEN PROCTOOSOON

: RUN

460 PRINT TAB(18,8) "Time="

TAB(12.12) "Hundredths

of a second TAB(0,0);

470 TIME =0

:REPEAT PRINT TAB(8

.IX) B\$

:PRINT TAB(12,10)

: IX= FX+1

:UNTIL IX=300R INKEY (-99

:TX=TIME

480 ENDPROC

490 DEF PROCCOLOUR

500 FOR I=1TO 1000+RND(3000)

. . . NEXT

: VBU 19,1,NX,0,0,0,7

510 ENDPROC

520 DEF PROCTODSOON

530 CLS

:PRINT TAB(1,10) "WAIT

FOR THE GREEN LIGHT!!!!

:FOR I=1TO 1000:

: NEXT

: *FX15, 1

540 A=1NKEY (3000)

550 ENDPROC

560 DEF PROCHESSAGE

570 CLS

PRINT TAB(0,10) You

took "STR\$ (TX-1)" hundr

edths of a second"

'you are 'M\$(TX/10)

580 FOR I=1TD 1000

: NEXT

: *FX15,1

590 PRINT

PRESS ANY KEY

600 ENDPROC

610 DATA EXCELLENT, VERY

6000,6000, RATHER POOR

, POOR , DISGRACEFUL, NEARLY

ASLEEP ASLEEP

This listing is included in this month's cassette tape offer. See order form on Page 45.

Catch up on what you've missed!



If you're a new reader you won't want to miss all the colourful games and programs listed in the first five issues of Electron User.

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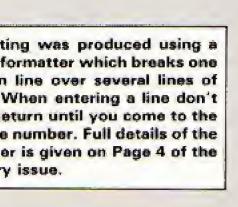
POST TO: Back Numbers, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Chicken listing

From Page 37

- 10 MODE &
- 20 PROCInstruct
- 30 REPEAT
- 40 MODE 5
- 50 PROCInitial
- 60 PROCPLay
- 70 PROCResult
- 80 UNTIL end
- 90 RUN
- 100 REM ***** Initial
 - *****
- 110 DEF PROCInitial
- 120 FOR I=1TO 2
- :speed(I)=0
 - :steer (1)=0
 - :distance(1)=0
 - :count(I)=40
 - :skid(1)=0
 - :y(f)=736
 - : NEXT
- 130 going=0
 - :spin=0
 - :car=0
 - :collision=0
 - :ditch=0
 - :wall=0
 - :end=0
 - :x(1)=32
 - :x(2)=1184
- 140 VDU 19,3,6;0;
- 150 MOVE 32,800
- : MOVE 32,820
 - :6COL 0.1
 - :PLOT 85,1247,800
 - :PLOT 85,1247,820
- 160 HOVE 32,640
 - :MOVE 32,620
 - :PLOT 85,1247,640
 - :PLOT 85,1247,620
- 170 COLOUR 1
- :PRINT TAB(6,1) "CHICKEN
- 180 COLOUR 2
 - :PRINT '" CAR 1";
 - : COLOUR 3
 - :PRINT SPC (10) CAR
 - 2'
- : VOU 5
- 190 ENDPROC
- 200 REM ***** Instruct
 - ****
- 210 DEF PROCInstruct
- 220 VDU 23,240,102,0,126

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.



- ,255,255,126,0,102 230 VDU 23,241,0,0,126
 - .255,255,126,0,0,23 ,242,8,28,42,73,8
 - .8,8,0
- 240 DIM speed(2), steer (2) ,distance(2),count(2)
 - , skid(2), x(2), y(2)
- 250 PRINT TAB(16,1) "CHICKEN
- "''' Car 1 and Car
 - 2 race at each other.
 - It is chicken to turn away first. To win
 - you must have covere d more road than theoth
 - er car. You loose if
 - you crash or "
- 260 PRINT "fail to stop.
 - Be careful about steer ing when moving fast,
 - you may skid."
 - TAB(16,13) "CONTROLS"
 - TAB (7,15) *CAR 1*
- SPC (15) "CAR 2"
- 270 PRINT 'SPC (9)*D accelerator
 - SPC (8) "ctrl brake
 - return* SPC (9)
 - steer up
 - "CHR\$ (242)" SPE (9) "Z steer
- down 280 PRINT " PRESS SPACE
- TO SEE WHO'S CHICKEN!
 - :REPEAT UNTIL GET =32
- 290 ENDPROC
- 300 REM ##### Move(n)
 - *****
- 310 DEF PROCMove(n)

- 320 IF (going AND n)=n THEN PROCStopped(n)
- 330 IF (spin AND n)=n

: ENDPROC

- THEN steer(n)=skid(n)
- 340 GCOL 0.0
- : MOVE x (n) , y (n)
 - : VDU 240
 - :x(n)=x(n)+speed(n)
 - :y(n)=y(n)+steer(n)
- 350 GCOL 0,1
 - :MOVE x (n), y(n)
 - : VDU 240
 - :600L 0,n+1
 - : VDU 8,241
- 360 SOUND 17,-15, speed(1)-s peed (2), 10
- 370 ENDPROC
- 400 REM ***** Play *****
- 410 DEF PROCPlay
- **420 REPEAT**
- 430 PROCReadkeys
- 440 PROCMove(1)
 - : PROCMove (2)
- 450 PROCTest
- 460 UNTIL going=3AND (count (!))1990R speed(1)=0)
 - AND (count(2))199 OR speed(2)=0)
- 470 ENDPROC
- 500 REM **** Readkeys *****
- 510 DEF PROCReadkeys
- 520 speed(1)=speed(1)-1.5+
 - INKEY (-51)+3+INKEY (-2
 - : IF speed(1)(0
- THEN speed(!)=0
- 530 speed(2)=speed(2)+1.5+ INKEY (-87)-3+INKEY (-7

- : IF speed (2) >0
- THEN speed(2)=0 540 steer (1)=INKEY (-98)-
 - INKEY (-34)
 - :IF distance(1)=0
 - AND steer (1)()0
 - THEN distance(1)=x(1)
 - ELSE steer(1)=steer(1)+
- speed(1)/4 550 steer(2)=(INKEY (-58)-
 - INKEY (-105)] #speed(2)/
 - : IF distance(2)=0
 - AND steer(2)()0
- THEN distance(2)=x(2) 560 ENDPROC
- 600 REM ***** Result *****
- 610 DEF PROCResult
- 620 YDU 4
 - :PRINT TAB(0,13)
 - : IF collision=1
 - THEN PRINT * You both
 - crashed!"'
 - ELSE IF car=3

 - THEN PROCNIDGE ELSE PROCStatus (1)
 - :PROCStatus (2)
- 630 COLOUR 1 :PRINT '* PRESS ANY
 - KEY OR " ... RETURN TO SEE" " INSTRUCTION
- S AGAIN";
- 640 FOR I=0TO 2000 :NEXT
- 650 +FX15,0
- 660 end=GET =13 **670 ENDPROC**
- 700 REM ***** Status(n)

Turn to Page 55

Educational Software





Brainteasers is the most original computer book of the year. Here at last is a collection of programs designed for the 15 plus age group.

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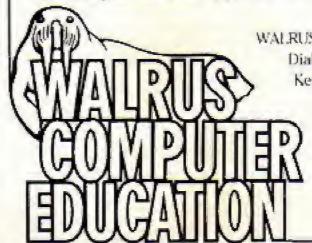
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Chicken listing

From Page 53

710 DEF PROCStatus(n)

720 COLOUR n+1

:PRINT "Car "in;" ";

: IF (spin AND n)=n

THEN PRINT "skidded," 730 IF (wall AND n)=n

THEN PRINT "over ran"

740 IF (ditch AND n)=n

THEN PRINT "hit the

ditch"

750 IF (wall AND n)=n OR (ditch AND n)=n

THEN PRINT "and crashed

A MEL

ELSE PRINT "won!""

760 PRINT

770 ENDPROC

BOO REM ***** Stopped(n)

810 DEF PROCStopped(n)

820 IF count (n) >199

THEN ENDPROC

830 count(n)=count(n)+16

:car=car AND (3-n)

:speed(n)=5

840 MOVE x(n),y(n)

:600L 3,RND(3)

:PLOT 1, count (n) -2*

RND(count(n)),count(n)-

2ªRND (count (n))

850 SOUND 16,-15,6,10

860 ENDPROC

900 REM +++++ Test 1++++

910 DEF PROCTest

920 IF ABS (x(2)-x(1))(64

AND A8S (y(2)-y(1))(32

THEN collision=1

:going=3

930 PROCTest!(1)

:PROCTest1[2]

940 ENDPROC

1000 REM +**** Test1(n)

1010 DEF PROCTest1(n)

1020 IF x(1) >x(2) AND speed(n

}=0

THEN going = going

: IF count (n) (41

THEN count (n)=200

:car=car OR n

1030 IF y(n) >8000R y(n) (672

THEN ditch=ditch

DR n

:acina∓acina OR n

1040 IF RMD(ABS (speed(n))))

20AND steer (n) AND RND(7))5

THEN spin-spin

OR R

:skid(n)=4#96N (

RND(2)-1.5)

1050 IF x(n))11840R x(n)(32

THEN wall=wall

OR n

:going=qoing OR n

1060 ENDPROC

1100 REM ***** Winner *****

1110 DEF PROCWinner

1120 |F distance(|)>1216-dis

tance(2) OR distance(1)=

THEN PRINT "Car 1";

ELSE PRINT "Car 2":

1130 PRINT * is the winner!*

1140 ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 45.

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'An excellent mixture of games offering various levels of difficulty and speed of response, entertaining enough to keep young children's attention and, on the whole, well-designed enough to help them learn while enjoying themselves'... Personal Software – Autumn 1983.

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... 'very good indeed' ... A & B Computing - Jan/Feb 1984.

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From Page 13

250 PRINT.

260 #FX202.48

270 INPUT "....... .. "B#

280 IF ASC (B\$) >64AND

ASE (8\$)(91

THEN PRINT TAB(0.4)

CHR\$ (136); CHR\$ (130); "NOT CAPITALS: CAPS and

SHIFT LOCK off. "

290 IF ASC (B\$)>64AND

ASC (B\$)(91

THEN INPUT "

PRESS RETURN TO

CONTINUE"Z#

300 IF Is=""

THEN 310

ELSE 290

310 IF ASE (B\$)>64AND ASC (B\$)(91AND Z\$=**

THEN 210

312 IF B\$="giveup"OR B\$=

"givein"

THEN PROCchicken 320 IF KK>1AND KK<4AND

LEN B\$(3

THEN PRINT TAB(0.6)

STRING\$ (40, CHR\$ (32))

330 IF KK>1AND KK<4AND

LEN B\$(3 **THEN 240**

360 6=6+1

370 IF B\$ (D\$ OR B\$)E\$ THEN SOUND 3,-15,5,30

380 IF B\$(D\$ DR B\$)E\$ **THEN 210**

390 B=INT (LEN (B\$)/2)

400 IF B\$(A\$(A) THEN PROCearly

410 IF B\$(A\$(A) THEN DS=BS

420 IF B\$)A\$(A)

THEN PROCLate 430 IF B\$>A\$(A)

THEN ES=BS

440 IF B\$=A\$(A) THEN PROCCOrrect

450 IF D=0

THEN 470

460 FOR Z=1TO 5000

SNEXT I

470 IF D=0

THEN 210 ELSE PROCend

480 IF Is="v" THEN PROCchoose This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on Page 4 of the February issue.

490 IF Z\$="v" THEN 80

500 CLS

:PRINT TAB(0,10) Thanks for the game."

520 REM

530 DATA and,ask,all,add ,after,am,an,are,apple

> , arm, bat, band, bag, bet ,bell,bend,book,but

,buli,bone,cat,cap,can

,cab,cake,car,cot,chat

,chip,chin,dig,dip,did

,done,day,egg,eat,end

, even, east

540 DATA fan, far, fat, full , fun, feel, food, fara

.fed.fit.gun.get.good

got, goal, had, hat, head

,hear, hut, in, ink, ill

,into,it,jet,jab,jog

, jump, jot, kit, king, key ,lap,log,lot,leg,last

.low.let

550 DATA mat, mate, met.meet

,meat, mug, moon, man, mist ,mint,not,no,near,nose

,new,on,only,old.open ,oak,pet,pat,put,pot

.pig.quick.queen.rat

,red,rip,sat,sit,sun

,so,sad,tan,tip,top .two,tea

560 DATA under up use vet .van.wet.went.will.where

,who,yet,yellow,yes

, you , zeo

570 DATA abbey, abbot, abide ,accelerate,access,accomp any, actual, adder, affirm

,apprentice,babe,baffle ,bagpipes,barren,bass

,beauty, bloat, booth

,brag,buckle,cabinet

,cabbage,carpenter,caulif

lower, chafe, character ,chubby,circumstance

.civil.colic 580 DATA dabble, decorate .design.degrade.dimension , dingy, duchess, drudge ,docile,divine,eager

,elaborate,elevate,embles

enlighten, episode, equate ,erupt,exchange,express

,fable,factor,falcon

,familiar,fend,filly

,figure,flour,foam,fourte

eath

590 DATA gable, gallog, garter .gangway.geology.ghastly ,giggle,gnat,graft,guide

,halter,hamburger,hamlet

.helicopter,hermit,horizo n.horde.hutch.hypnosis

,hydrant,idiot,illegal

, illuminate, important

,inflate,inject,inquest insult, iodine, invest

600 DATA jackboot, jackdaw

, jewel, jingle, jockey , jive, judo, jumble, jungle

, junction, kangaroo, keel

,kettle,kidnap,kilt

, kitchen, kneel, know ,knit,kipper,ladder

,ladie,lamb,lance,lantern

,laugh,lever,library ,loiter, tollipop

610 DATA machine, mackerel , magistrate, marine, meteor ,mischief,miser,moderate

> , muscle, mutiny, nail ,napkin,nature,needle

nerve, notch, nylon, nurse .notice.nothing.oasis

.objective.obstacle

obtain, official, orange

, ordeal, otter, ounce overtake

620 DATA pace, paddle, painter , panther, partner, passenge

r,pension,pepper,pigeon ,plague,racket,radio

,ramble,rash,remove ,respect,robot,ruggage

,rustle,rung,sacrifice

, saint, salmon, sample

.scarlet.scrounge.second , seesaw, serve, severe

630 DATA tablet tapestry ,tattoo,teach,telephone ,thatch, tight, tongs ,tramp,tremble.umbrella .uapire.uncle.underground ,unicorn,unifore,upright usual united until , vacant, vacuum, valley

,value,vampire,vandalise

, vanish, vein, venos, verse 640 DATA wade, wafer, wages ,wallet,warden,wasp , watch, wax, weave, weird ,xylophone,yacht,yard ,year, yeast, yesterday ,yoga,yolk,young,youth

,2004

650 DATA abacus, abated, abbato ir.ablution.actuate .acumen.adulterate.affili

,zebra,zero,zigzag,zip

ate, aileron, alkali, alum ,anthrax,antitoxin,apocal ypse,apoplexy,aquiline

,asphalt,asphyxiation ,aspic,attenuate,auk

,awry,axiom,axial,aisle 660 DATA baccarat, bagatelle

,baize,ballistics,banshee ,barbarous,barbecue

, barracuda, bauble, bazooka , bazaar, beaux, bedraggled ,bibliography,binary

,biographical,blithesome ,bludgeon,blurt,bogus

,boracic,braille,bunion ,burly,butterscotch

670 DATA cache.caffeine ,cajole,calibre,calligrap hy, callow, camphor, canniba listic,capillary,casement ,cashmere,cataclysmal ,cauldron,caustic,cam

> ,cessation,chanois,cheque red, cheroot, clocke, coerce ,crypt,crucible,cubisa

,cygnet

680 DATA dachshund, dangle ,dapple,debilitate,decarb onisation, decry, deem , defer, degenerate, detonat e, devoid, diaphanous ,digit,digress,diaple

> , ditty, divest, divot , domain, doublet, dragoon

> ,dire,disciple,disgorge

,droll
690 DATA earl,easel,eaves
,echelon,ecology,ecstasy
,editorial,effervesce
,effigy,elapse,electrothe
rapy,elixir,encompass
,endow,ensign,ermine
,espy,etch,eunuch,exalt
,exorcise,extricate
,eye,extol,ethnic

700 DATA facia, faction, fang , farce, farrier, fatigue , fauna, feign, feline , ferrous, ferrule, festoon , fettle, feudalise, fidget , fiery, finch, firkin , flagon, flax, forceps , forge, frieze, frugal , fulmar

710 DATA gable,qaiety,galore
,gambit,gantry,garish
,garrulous,geophysics
,gesticulate,geyser
,gherkin,ghetto,gibber
,gigolo,goitre,gossamer
,grebe,gristle,guise
,gurgle,gurnard,guzzle
,gypsum,gyrate,grope

720 DATA haft, haggis, hake
, hale, halibut, hallow
, hank, hearse, heckle
, heifer, helical, heinous
, hieroglyph, homage, hookah
, hovel, hubbub, hue, humify
, humiliate, hunch, hurtle
, hydra, hyphen, hypothesis

730 DATA ichthyology,igloo
,ignoble,illegible,illici
t,imago,immune,impend
,impetus,incantation
,incense,indigo,indolent
,induce,ionise,iridescent
,irk,irony,irradiate
,isosceles,isotherm
,issue,isthmus,invert
,invest

740 DATA jabber, jacknife
, jamb, jangle, jape, jasper
, jaunty, jealous, jeopardy
, jetsam, jilt, jocular
, joggle, jostle, joust
, jubilation, judiciary
, jugular, juniper, juxtapos
ition, kaleidoscope, kaolin
, kedgeree, khaki, knightly

750 DATA laburnun, lacerate
,laconic, lacquer, laity
,laminate, lamprey, languis

h,laudanus,lascivious ,lecher,lectern,legion ,leveret,lichen,lieutenan t,lilt,liabo,loganberry ,logistics,loin,longevity ,loofah,lope,lotion

760 DATA macaw.madrigal
,magenta,mahlstick,maim
,malleable,mamba,manacle
,mediocre,megalith,menial
,mesmerism,meteor,mettle
,micrometer,mimosa,minim
,minuet,mnemonic,moccasin
,modulate,moult,mucus
,myrrh,myxomatosis

770 DATA narcissus, narcosis
, natal, nausea, nebula
, negate, neigh, nephew
, nestle, neural, neuter
, newt, nimble, nocturne
, nomadic, nonentity, nostal
gia, notch, nuptial, nurture
, nymph, nylon, nudge, nougat
, nodule

780 DATA oakum.obelisk.obliqu e.obscene.obviate.occult .ocean.ocelot.ochre .octet.ocular.omega .omen.omnivorous.onerous .onion.ophthalmic.opulant .orchid.ordnance.orphan .ovation.owlet.oxide

790 DATA palette,papal,parado
x,pedant,percolate,permea
te,phial,phlox,pierce
,piquant,pliable,plumage
,posy,prefix,prophylactic
,prude,pylon,pyre,pyromet
er,proctor,prior,pout
,poop,plankton,pinion

800 DATA quaff,quail,quell
,quip,quire,quoit,quotien
t,raffia,rancid,ratchet
,recidivist,recluse
,reflex,rhetoric,ribald
,ricochet,rotor,roundel
,rowel,rue,russet,rustic
,revue,remiss,rejuvinate

810 DATA sachet, saffron
, salient, salver, scarab
, sceptre, schedule, scimita
r, scree, scythe, seance
, seethe, sepia, seraph
, shekel, shingle, sienna
, signet, silhouette, skein
, slake, squeeqee, strafe
, strew, sultry
820 DATA taboo, tabular, tallow

,tapioca,taunt,tedium ,tempest,tenacious,tendri l,tentative,termite ,tertiary,thespian,threw ,tier,tinder,torsion ,tourniquet,tract,tranqui l,trauma,trellis,trifle ,tripartite,turmoil

830 DATA udder,ullage,umber ,uncouth,urchin,urge ,usher,utility,utterance ,usurp,vague,valiant ,vanilla,varlet,vector ,vegetate,vehicle,veneer ,venison,vertigo,vespers ,veto,vicinity,viola ,virtuoso

840 DATA waddle,waft,waif
,wan,wand,wanton,warbler
,warlock,wary,weft,wharf
,wheedle,whelk,whelp
,whet,whiff,wield,wiggle
,wilful,winkle,withe
,wrack,wrest,wright
,wrought

850 DATA yashmak,yaw,yelp ,yeoman,yokel,zenith ,zephyr,zest,zither ,zodiac

860 END 870 REM

880 DEF PROCearly 890 PRINT TAB(5,13)*

900 PRINT TAB(20-8,13)8\$
910 ENDPROC
920 REM
930 DEF PROCIate

950 PRINT TAB(20-8,19)8\$

960 ENDPROC

970 REM

980 DEF PROCcorrect 990 PRINT TAB(0,16)*

940 PRINT TAB(5,19)*

.

1000 PRINT TAB(18-B,16) CHR\$ (136); CHR\$ (130); B\$ 1010 D=D+1

1020 ENDPROC

1030 REM 1040 DEF PROCend

1050 CLS

1060 PRINT TAB(0,4) "Yes, the word was "; CHR\$ (34); A\$(
A); CHR\$ (34)

1070 IF 6>1
THEN PRINT TAB(0,7) "You took ";6;" guesses to find the word."

1080 IF G=1
THEN PRINT TAB(0,7) "You took ";6;" guess to find the word."

1090 IF 6(4
THEN PRINT TAB(0,8)*(Have you filled in your pools today?)*

1100 PRINT TAB(0,10) You said you would take ";66

1110 IF 6>66
THEN PRINT TAB(0,13)
"You LOST. You buy the coffee."

1120 IF 66>6 THEN PRINT TAB(0,13) "OK.,don"t keep on. I know you won."

1130 IF 66=6 THEN PRINT TAB(0,13) "We'll call that one quits."

1140 +F1202,48

1150 PRINT TAB(0,20) "RETURN
y if you wish to play
again or
n to END."

1160 INPUT 2\$

1170 IF Z\$<>"y"AND Z\$<>"n" THEN 1150

1180 ENDPROC

1190 REM

1200 DEF PROCintro

1210 CLS

1220 PRINT :PRINT :PRINT "Teacher,"

1230 PRINT " This
program gives practice
with the concept
of alphabetical order.
It is in the form of
a game, the rules of
which are explained
overleaf."

1240 PRINT

:PRINT *The game may

be played with or withou

t the aid of a dictionar

y, as you choose, but

no words of less than

three letters will be
accepted except at level



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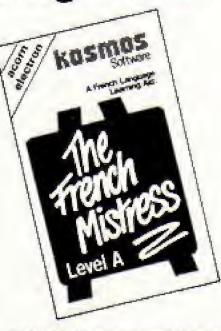
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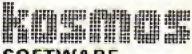
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SOFTWARE

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Australian Coffee listing

From Page 5	7	player thinks of a word	1410			* ?*
No. 1. *		and writes it down			1570	IF AA=3 AND 66)=8
1250 PRINT		without the second playe		: INPUT "PRESS THE RETURN		AND 86(=12
:PRINT "Lower	race letter	r seeing*	1120	KEY TO CONTINUE. "Z\$		THEN PRINT 'I suggest
s are used thr	1746	PRINT "it. The second		ENDPROC		we make that ";66-4
so make sure	a.	player then states how		REN	1580	PRINT
is off.		many guesses he will		DEF PROCdeal		:1F AA=2 AND 66>=8
		need to find what the	1450	AA\$="="		AND 66(=12
is, the light	is out.	word is. If the number		:88\$="="		THEN INPUT "RETURN Y
1260 PRINT		of guesses stated		:CC\$=""		OR n "AA\$
:PRINT "After		is acceptable to the		: AA=0	1590	PRINT
e has been mad		first player,		:88=0		: IF AA=3 AND 68)=8
be entered by	pressing	the game proceeds."		:CC=0		AND GG(=12
RETURN."	1350	PRINT " As each guess		:DD=0		THEN INPUT "RETURN Y
1270 PRINT TAB(0,22	1-41622	is made by the second		:EE=0		OR n *AA\$
RETURN to con	tinue."	player, the first playe		:FF=0	1600	IF AA\$(>"y" AND AA\$(>
1280 INPUT z\$		r tells him whether		: GG=0		"n"AND AA\$()"="
:IF z\$()**		it is alphabetically		:A\$(181)=""		THEN 1580
THEN 1270		earlier or alphabeticall	1460	CLS	1610	IF AA\$="y" AND AA=2
1290 CLS		y later than the hidden'		:PRINT		
:PRINT TABLO, S	1.560	PRINT "word. The air		: INPUT *Right then, cobbe		THEN 66=66-2
one more poin	it before	of the second player		r, how many guesses do	1620	IF AA\$="y" AND AA=3
we go; if	you are	is to move closer and		you think you'll need	ä	
unable to fir	id the word	closer to the word		to find this word of		THEN 66=66-4
and you wish	to give	until he finds it."		mine?*66	1630	IF AA\$="y"
up, simply re	spand to	PRINT	1470	PRINT		THEN 2080
the prompt t	y typing	:PRINT		: IF 66>30	1640	IF AAs="n"
"; CHR\$ (34);	giveup";			THEN PRINT "Not a chance,		THEN PRINT *OK, What
CHR\$ (34)		INPUT PRESS THE RETURN		pal. Drop it to somethin		
1292 PRINT	1461	KEY TO CONTINUE. "Z\$		g under 30 or we aren't		
:PRINT "After	doing this	CLS		even talking."		THEN INPUT BB
you will need	to press		1490	IF GS>30	1440	PRINT
the ESCAPE ke	1	PRINT	11WY	THEN INPUT 66	1004	: [F AA=2 AND BB(=66-1
N the program.		:PRINT "The computer/teac	1400	1F 66>30		11 HH-1 HH-2 DV-00 1
1294 PRINT TAB(0,20		her will choose a word.	PAIN	THEN 1480		THEN ODINT PURE I SECON
RETURN to con		and the computer will	1500	IF 66)12		THEN PRINT "Yes, I accep
1296 INPUT 2\$	CINE.	draw a line to repres	1200	THEN 1820		IT AA-O AND DOZ-DO I
:IF 2\$()**		ent it. It will then	1514		10/0	IF AA=2 AND BB<=66-1
THEN 1294		ask you to guess what	1310	PRINT		THEM AGES
1298 CLS		the word is."		: IF 66(8		THEN 2040
1300 PROCchoose	1390	PRINT		THEN PRINT "O.K. I accept	1000	17 HH=2 HMU BB266=1
1310 CLS		:PRINT "Incorrect guesses	LEGA	that."		THEN ARTHE THE
:PRINT		which are	1250	IF 66CB		THEN PRINT "Not good
		alphabetically earlier		THEN 2040		enough, my friend. Try
PRINT	*******	than the hidden	7233	AA=RND(3)		again.'
	AUSTRALI	word will be printed	1540	IF AA=1 AND GG>=8	1940	IF AA=2 AND 88>66-1
AN COFFEE GAME		above the line; guesse		AND 66(=12		THEN THREE DA
1320 PRINT *	********	s alphabetically later		THEN PRINT "Hos, go on		THEN INPUT CC
************		will be printed below."		then, I accept."	1700	IF AA=2 AND CC(=66-1
1330 PRINT	1400		1550	IF AA=1 AND GG>=8		market make
:PRINT "They t		:PRINT "Guesses which		AND 66(=12		THEN 2040
this game is		move further away from		THEN 2040		PRINT
in cafes	in Australi	thehidden word instead				: IF AA=2 AND CC>6G-1
a to decide wh	o is to	of nearer to it will		AND 66(=12		
pay for the	coffee.	be beeped and will count		THEN PRINT "No, not this		
The idea is t	hat nne	as a try."		time. How about *:66-2:		

Australian Coffee listing

Fre	om Page 59		it.*		AND CC=0	2220	PRINT
	1,	1870	1F DD=1 OR DD=2 OR DD=3		THEN SG=BB		:PRINT
	THEN PRINT "OK. Don't			2060	IF AA=2 AND CC(=66-1	4	INPUT "Type the number,
	play."		THEN INPUT EE		AND CC()0		press RETURN and hand
1720	IF AA=2 AND CC)66-1	1880	PRINT		THEN 86=CC	2000	over to your pupil.*66
			: IF EE(=12	2070	IF AA=3 AND 8B(=66-2		ENDPROC
	THEN 1720		THEN GG=EE			2240	
1730	IF AA=3 AND BB<=66-2		ELSE PRINT "S'long then."				DEF PROCchoose
		1690	IF EE>12	2080	PRINT You say you will	2260	
	THEN PRINT "Yes, 1'11		THEN 1870		find the word in ";66;		:PRINT TAB(0,3) LEVEL
	take that."	1900	IF EEC=12		" quesses. You're		1 simple, common,
	IF AA=3 AND B9<=66-2		THEN 2040		on."		three and
			PRINT	2090	PRINT		four letter words.
	THEN 2040		: [F'DD=5		: INPUT "PRESS RETURN		LEVEL 2
	PRINT		THEN PRINT "Don't auck		TO CONTINUE. "ZZ\$	2274	common longer words."
	: IF AA=3 AND BB>66-2		about. Make it ":66-10;	2100	IF II\$=""	2214	PRINT "LEVEL 3 long
			" or we stop talking		THEN ENDPROC		and short "; CHR\$ (34);
	THEN PRINT "Huh. 1411		now."		ELSE 2090		"interesting"; CHR\$ (34); " words."
	go to ";66-3;" but not	1920	7	2110		2200	PRINT
	less. Answer y or n'		ilF DD=5		DEF PROCEYWORD	2200	:PRINT "Type 1, 2 or
	IF AA=3 AND BB>66-2		THEN INPUT "Answer y	2130	A=181		3 to choose the difficul
			or n, "CC\$:CLS		ty level, and press RETUR
	THEN INPUT 88\$			2140	PRINT TAB(0,7) Right		M.
1770	IF BB\$(>"y" AND BB\$(>		THEN. 66=66-10		then Teach; type in	2290	PRINT "
		-	IF CC\$="y"		your chosen word luse	22.19	Than,
. 754	THEN 1760		THEN 2040		lower case letters)		Type 4 and RETURN
	IF BB\$="y"	1950	PRINT	2150	and press RETURN:		if you wish to choose
	THEN GG=GG-3		#IF CC\$="n"	2130	PRINT *		a word of your own."
	IF 88\$="y"		THEN PRINT "Well, make		If, however, you	2300	INPUT KK
	THEN 2080 PRINT	1016	an offer."		wish the computer to		IF KKC21 AND KKC22
1800	:1F B8#="n"	* .	IF CC\$="n" THEN INPUT FF		choose the word then		AND KKC33 AND KKC34
	THEN PRINT "If that's				type "; CHR# (34); "comp";		
			:IF FF>66+8		CHR\$ (34); and press		THEN 2300
	the way you want it.		THEN PRINT "Not today,		RETURN.	2320	IF KK=4
	then buy yer own rotten			2140	INPUT A\$(A)		THEN PROCeyword
1010	coffee, cobber." IF BB\$="n"	roan	tiger." IF FF>66-8		IF ASC (A\$(A))(97		ENDPROC
	THEN 60TO 1810	1700	THEN 1980	FILV	OR ASC (A\$(A)))122		REM
		1000	IF FF(GG-8 AND FF(=8		THEN PRINT "+++++Lower		DEF PROCchicken
1	IF DD=5	1130	II II COO O MAD II COO		case please*******	2502	CLS CLS
1030	THEN 1910		THEN GG=FF	2190	IF ASC (A\$(A))(97	2510	PRINT TAB(0,10) CHR\$ (136)
1940		2000	IF FF>=8 AND FF(=12	4400	OR ASC (A\$(A))>122		;CHR\$ (131);CHR\$ (157);
	: IF DD=4 OR DD=6	Train	II II S THE PROPERTY OF S THE		THEN VOU 7		CHR\$ (129);A\$(A)
			THEN 1530	2190	IF ASC (A\$(A))(97	2520	PRINT TAB(0,14)" YOU
	goes. ";66;" it is."				OR ASC (A\$(A))>122		BUY THE COFFEE FOR THE
	IF DD=4 OR DD=6		THEN PRINT "I think we		THEN 2160		NEXT YEAR, (and the
	THEN 2040		should start again."	2200	IF A\$(A)="comp"		chicken sandwiches,
1850	PRINT	2	PRINT	2240	THEN ENDPROG		Cobberl."
	: IF DD=1 OR DD=2		: INPUT "PRESS RETURN	2210			0 60T0 2530
	OR DD=3		TO CONTINUE. "ZZ\$:PRINT TAB(0,5) "Now,	2540	ENDPROC
	THEN PRINT "Sorry, chum,				haggle with your pupil		
	don't think I can accept		THEN 1450		and agree on the maxim	7/	his listing is included in
	a number more than 12.		ELSE 2020		um number of tries he/she	th	is month's cassette
	Cium an a number heleu				Scallaund to succe	1 +0	pe offer. See order

form on Page 45.

isallowed, to guess

your word."

Sive me a number below 2040 PRINT

that and 1'11 consider 2050 IF AA=2 AND BB<=68-1

electron user



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Micro messages

Thinking bigger

I AM a beginner at computing as I only received my Electron on December 23.

Please could you tell me how to produce double height characters as I am in the process of writing an educational program for my younger sister. I would be very grateful if you could do this. - Paul Vanags.

 You must have read our minds. We'll have a program that will do that (and more) fairly soon, hopefully in the next issue.

Software line-up

COULD you attempt to list the BBC software compatible with the Electron and hence widen the software base for Electron users?

Current information is too vague couched in terms like "should be", "may be slower" etc. -

Paterson, Larkhall, Lanarkshire.

 Frankly it would be an endless task. The commercial software that will run on the Electron is clearly marked as such, probably because no one wants to miss out on the extra market that the Electron gives.

As for the changes that might be necessary to run magazine games for the BBC, we'll be running an article on them soon.

Case of the lost line

A QUESTION which many readers will be interested in. When I switch on my Electron I seem to lose my first

Alas, *TV255 doesn't work as someone had suggested and it is now getting on my nerves.

Also will you please explain how to draw circles using VDU5 and COS and SIN RADS. -Hasan Bobut, Batley.

 Sadly *TV 255 won't work on the Electron as you have found out. It's a command that does work on the BBC Micro but won't on the Electron, which doesn't have the necessary micro chip.

Off hand we can't think of any way of remedying your problem, but having said that, we are sure someone will write in telling us how it can be done!

As for circles, take a look at the program by Mike Cook this month.

OS poser

WHILE you produced an excellent magazine for February one thing struck me as strange.

In the letter entitled "Which OS?" you claim the Electron has OS 1.2, but when I typed in *HELP to find which OS I have, the computer replied with OS 1.00.

Is my machine a dud? The serial number is 0011633 and it was bought in December. -David Thornton, Henley-on-Thames.

 No. your machine isn't a dud. The Operating System of the Electron is the 1.00. This, to all intents and purposes, can be looked on as the equivalent of the 1.2 OS of the BBC Micro.

Conversion is not on

I'VE been told that I will be able to convert my Electron into a BBC Micro. Is this true? -Peter Grainger, Pres-

 The short answer is no, though what with the hardware add-ons that are available and promised you'll eventually be able to get a very close approximation.

Stationary at LINE 210

USING the program Island on my introductory cassette my tape stops and BLOCK AT LINE 210 appears on the screen.

I had an Electron for Christmas and it had a faulty keyboard, so we took it back to the shop.

A week or so later I oot a new Electron and

to my horror on the program Island, BLOCK AT LINE 210 came up on the screen. - Alix Vears, Wigginton, Herts.

 Don't worry, I don't think it's your Electron. It might be that the tape itself is faulty - in which case your dealer will exchange it.

Or the volume and/or tone levels on your cassette recorder may need changing.

Not so available

I HAVE been the proud owner of an Acorn Electron for about two months and was pleased to see your publication inside the Micro User.

But one thing that has annoyed me is the availability of software for it. There is plenty of software advertised for the Electron but when you try to obtain them it's a different matter. -

Steven Douglas, Buckhurst Hill, Essex.

We must agree that a

couple of months ago the software situation was fairly bad. Happily things have changed and practically every day a new batch of Electron software lands on our

Iron Ring clanger

THE other day a friend of mine told me that he couldn't get January's fron Ring program working.

This puzzled me as I'd entered it in with no problems. However, looking at his listing I saw that he had entered line 50 as:

VDU29,640±SIN (6) #100; 512 +005(6)+100

Of course this should

VBU29.640+SIN (B) +100: 512 +005(6) +100

with a comma after 29. not a full stop. Looking at his magazine I must admit that on his listing it did look that way. I thought maybe some of your readers might have had a similar problem. -Mark Twigg, Glossop.

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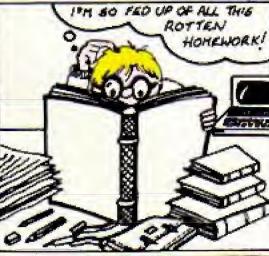
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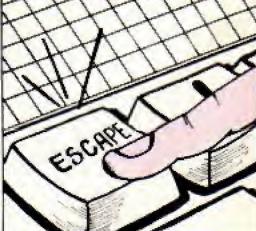
yourselves. So tear yourself away from your Electron keyboard and drop us a line.

The address is: Micro Messages Electron User Europa House 68 Chester Road Hazel Grove Stockport SK7 5NY.









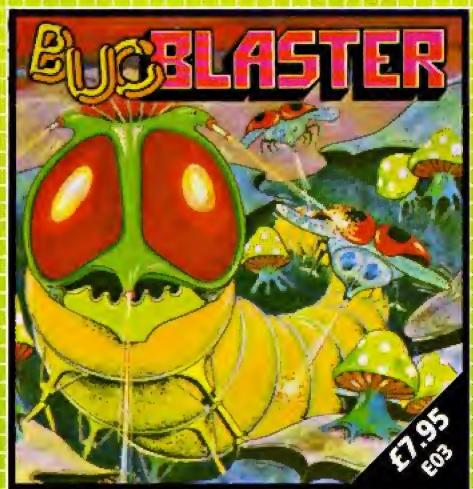
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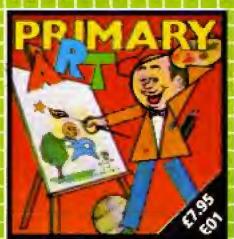
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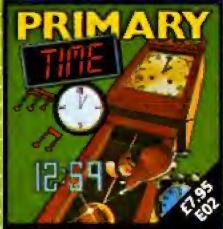
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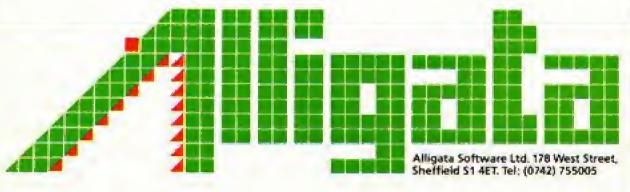
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